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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
C07D 213/50, A01N 43/40, 43/56, 43/78, 43/80, C07D 213/53, 231/12, 231/20, 277/24, 401/12

A1

(11) International Publication Number: WO 97/46530

(43) International Publication Date: 11 December 1997 (11.12.97)

(21) International Application Number: PCT/US97/09569

(22) International Filing Date: 2 June 1997 (02.06.97)

(30) Priority Data:

60/019,352	6 June 1996 (06.06.96)	US
60/033,633	20 December 1996 (20.12.96)	US

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(81) Designated States: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KG, KP, KR, KZ, LC, LK, LR, LT, LV, MD, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, TJ, TM, TR, TT, UA, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

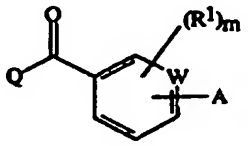
With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

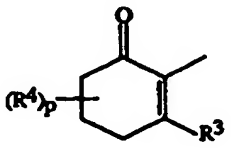
(54) Title: HERBICIDAL PYRIDINYL AND PYRAZOLYLPHENYL KETONES

(57) Abstract

Compounds of Formula (I), and their *N*-oxides and agriculturally suitable salts, are disclosed which are useful for controlling undesired vegetation wherein Q is Q-1, Q-2, Q-3 or Q-4; and A, W, R^1, R^3-R^{11}, and m are as defined in the disclosure. Also disclosed are compositions containing the compounds of Formula (I) and a method for controlling undesired vegetation which involves contacting the vegetation or its environment with an effective amount of a compound of Formula (I).



(I)



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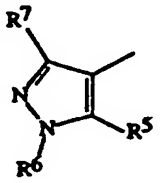

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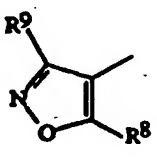

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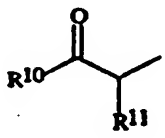

Q-4

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TITLE

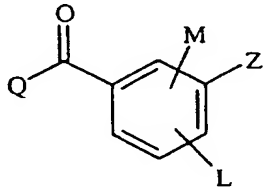
HERBICIDAL PYRIDINYL AND PYRAZOLYLPHENYL KETONES

BACKGROUND OF THE INVENTION

This invention relates to certain phenyl ketones, their *N*-oxides, agriculturally suitable salts and compositions, and methods of their use for controlling undesirable vegetation.

The control of undesired vegetation is extremely important in achieving high crop efficiency. Achievement of selective control of the growth of weeds especially in such useful crops as rice, soybean, sugar beet, corn (maize), potato, wheat, barley, tomato and plantation crops, among others, is very desirable. Unchecked weed growth in such useful crops can cause significant reduction in productivity and thereby result in increased costs to the consumer. The control of undesired vegetation in noncrop areas is also important. Many products are commercially available for these purposes, but the need continues for new compounds which are more effective, less costly, less toxic, environmentally safer or have different modes of action.

WO 96/26200 discloses pyrazoles of Formula i as herbicides:



i

wherein, *inter alia*

Q represents a cyclohexane-1,3-dione ring;

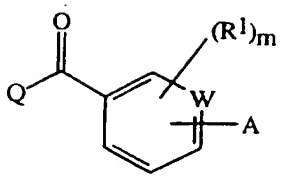
L and M are hydrogen, C_1-C_6 alkyl, C_1-C_4 alkoxy, halogen or nitro; and

Z represents a five to six-membered heterocyclic saturated or unsaturated group.

The phenyl ketones of the present invention are not disclosed in this publication.

SUMMARY OF THE INVENTION

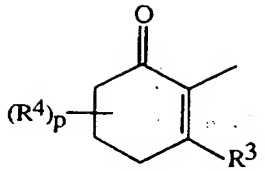
This invention is directed to compounds of Formula I including all geometric and stereoisomers, *N*-oxides, and agriculturally suitable salts thereof, agricultural compositions containing them and their use for controlling undesirable vegetation:



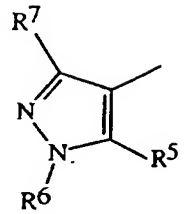
I

wherein

Q is



Q-1



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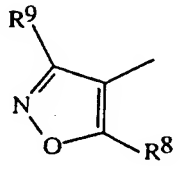
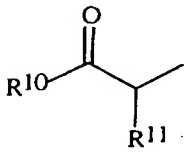


Q-3

or



Q-4

;

A is a five- to ten-membered monocyclic or fused bicyclic ring system, which may be fully aromatic or partially saturated, containing 1 to 4 heteroatoms independently selected from the group nitrogen, oxygen, and sulfur, provided that each heterocyclic ring system contains no more than 2 oxygens and no more than 2 sulfurs, and each ring system is optionally substituted with one to three R^2, provided that when a nitrogen atom of a heterocyclic ring is substituted with R^2, then R^2 is other than halogen;

each R^1 is independently H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, halogen, cyano, nitro, $-(Y)_t-S(O)_nR^{15}$ or $-(Y)_t-C(O)R^{15}$;

W is N or CH;

Y is O or NR^{12};

R^2 is C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_3-C_6 alkenyloxy, C_3-C_6 alkynyloxy, mercapto, C_1-C_6 alkylthio, C_1-C_3

haloalkylthio, C_3-C_6 alkenylthio, C_3-C_6 haloalkenylthio, C_3-C_6 alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5 acetylalkylthio, C_3-C_6 alkoxycarbonylalkylthio, C_2-C_4 cyanoalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, aminosulfonyl, C_1-C_2 alkylaminosulfonyl, C_2–C_4 dialkylaminosulfonyl, $(CH_2)_rR^{16}$, $NR^{12}R^{13}$, halogen, cyano or nitro; or R^2 is phenyl or benzylthio, each optionally substituted on the phenyl ring with C_1-C_3 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy, 1-2 halogen, cyano or nitro;

R^3 is OR^{14}, SH, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, halogen or $NR^{12}R^{13}$; or R^3 is phenylthio, phenylsulfonyl or $-SCH_2C(O)Ph$, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro;

each R^4 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, C_1-C_3 alkylthio or halogen; or when two R^4 are attached to the same carbon atom, then said R^4 pair can be taken together to form $-OCH_2CH_2O-$, $-OCH_2CH_2CH_2O-$, $-SCH_2CH_2S-$ or $-SCH_2CH_2CH_2S-$, each group optionally substituted with 1-4 CH_3;

R^5 is OR^{14}, SH, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, halogen or $NR^{12}R^{13}$; or R^5 is phenylthio, phenylsulfonyl or $-SCH_2C(O)Ph$, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro;

R^6 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl or $-CH_2CH_2OR^{12}$; or R^6 is phenyl or benzyl, each optionally substituted on the phenyl ring with C_1-C_3 alkyl, halogen, cyano or nitro;

R^7 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, halogen, cyano or nitro;

R^8 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 cycloalkyl or C_3-C_6 halocycloalkyl;

R^9 is H, C_2-C_6 alkoxycarbonyl, C_2-C_6 haloalkoxycarbonyl, CO_2H or cyano;

R^{10} is C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 cycloalkyl optionally substituted with 1-4 C_1-C_3 alkyl or C_3-C_6 halocycloalkyl;

R^{11} is cyano, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylcarbonyl, $S(O)_nR^{13}$ or $C(O)NR^{12}R^{13}$;

each R^{12} is independently H or C_1-C_6 alkyl;

R^{13} is C_1-C_6 alkyl or C_1-C_6 alkoxy; or

R^{12} and R^{13} can be taken together as $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2CH_2-$ or $-CH_2CH_2OCH_2CH_2-$;

R^{14} is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_2-C_6 alkoxyalkyl, formyl, C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, $C(O)NR^{12}R^{13}$, C_1-C_6 alkylsulfonyl or C_1-C_6 haloalkylsulfonyl; or R^{14} is phenyl, benzyl, benzoyl,

$-CH_2C(O)$phenyl or phenylsulfonyl, each optionally substituted on the phenyl ring with C_1-C_3 alkyl, halogen, cyano or nitro;

R^{15} is $NR^{12}R^{13}$, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl or C_3-C_6 cycloalkyl; or R^{15} is phenyl optionally substituted with C_1-C_3 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy, 1-2 halogen, cyano or nitro;

R^{16} is C_1-C_3 alkoxy, C_2-C_4 alkoxycarbonyl, C_1-C_3 alkylthio, C_1-C_3 alkylsulfinyl or C_1-C_3 alkylsulfonyl; or R^{16} is phenyl optionally substituted with C_1-C_3 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy, 1-2 halogen, cyano or nitro;

m is 0, 1, 2 or 3;

n is 0, 1 or 2;

p is 0, 1, 2, 3 or 4;

r is 1, 2 or 3; and

t is 0 or 1;

provided that when W is CH and A is in the *meta* position with respect to the group Q-C(O)- of Formula I, then m is 3 and R^1 is other than H.

In the above recitations, the term "alkyl", used either alone or in compound words such as "alkylthio" or "haloalkyl" includes straight-chain or branched alkyl, such as, methyl, ethyl, *n*-propyl, *i*-propyl, or the different butyl, pentyl or hexyl isomers. The term "1-2 alkyl" indicates that one or two of the available positions for that substituent may be alkyl. "Alkenyl" includes straight-chain or branched alkenes such as 1-propenyl, 2-propenyl, and the different butenyl, pentenyl and hexenyl isomers. "Alkenyl" also includes polyenes such as 1,2-propadienyl and 2,4-hexadienyl. "Alkynyl" includes straight-chain or branched alkynes such as 1-propynyl, 2-propynyl and the different butynyl, pentynyl and hexynyl isomers. "Alkynyl" can also include moieties comprised of multiple triple bonds such as 2,5-hexadiynyl. "Alkoxy" includes, for example, methoxy, ethoxy, *n*-propyloxy, isopropyloxy and the different butoxy, pentoxy and hexyloxy isomers. "Alkoxyalkyl" denotes alkoxy substitution on alkyl. Examples of "alkoxyalkyl" include CH_3OCH_2, $CH_3OCH_2CH_2$, $CH_3CH_2OCH_2$, $CH_3CH_2CH_2CH_2OCH_2$ and $CH_3CH_2OCH_2CH_2$. "Alkylthio" includes branched or straight-chain alkylthio moieties such as methylthio, ethylthio, and the different propylthio, butylthio, pentylthio and hexylthio isomers. "Alkylsulfinyl" includes both enantiomers of an alkylsulfinyl group. Examples of "alkylsulfinyl" include $CH_3S(O)$, $CH_3CH_2S(O)$, $CH_3CH_2CH_2S(O)$, $(CH_3)_2CHS(O)$ and the different butylsulfinyl, pentylsulfinyl and hexylsulfinyl isomers. Examples of "alkylsulfonyl" include $CH_3S(O)_2$, $CH_3CH_2S(O)_2$, $CH_3CH_2CH_2S(O)_2$, $(CH_3)_2CHS(O)_2$ and the different

butylsulfonyl, pentylsulfonyl and hexylsulfonyl isomers. "Alkylamino", "dialkylamino", and the like, are defined analogously to the above examples. "Cycloalkyl" includes, for example, cyclopropyl, cyclobutyl, cyclopentyl, and cyclohexyl.

The term "halogen", either alone or in compound words such as "haloalkyl", includes fluorine, chlorine, bromine or iodine. Further, when used in compound words such as "haloalkyl", said alkyl may be partially or fully substituted with halogen atoms which may be the same or different. Examples of "haloalkyl" include F_3C, $ClCH_2$, CF_3CH_2 and CF_3CCl_2. The terms "haloalkenyl", "haloalkynyl", "haloalkoxy", and the like, are defined analogously to the term "haloalkyl". Examples of "haloalkenyl" include $(Cl)_2C=CHCH_2$ and $CF_3CH_2CH=CHCH_2$. Examples of "haloalkynyl" include $HC\equiv CCHCl$, $CF_3C\equiv C$, $CCl_3C\equiv C$ and $FCH_2C\equiv CCH_2$. Examples of "haloalkoxy" include CF_3O, CCl_3CH_2O, $HCF_2CH_2CH_2O$ and CF_3CH_2O. Examples of "haloalkylthio" include CCl_3S, CF_3S, CCl_3CH_2S and $ClCH_2CH_2CH_2S$. Examples of "haloalkylsulfonyl" include $CF_3S(O)_2$, $CCl_3S(O)_2$, $CF_3CH_2S(O)_2$ and $CF_3CF_2S(O)_2$.

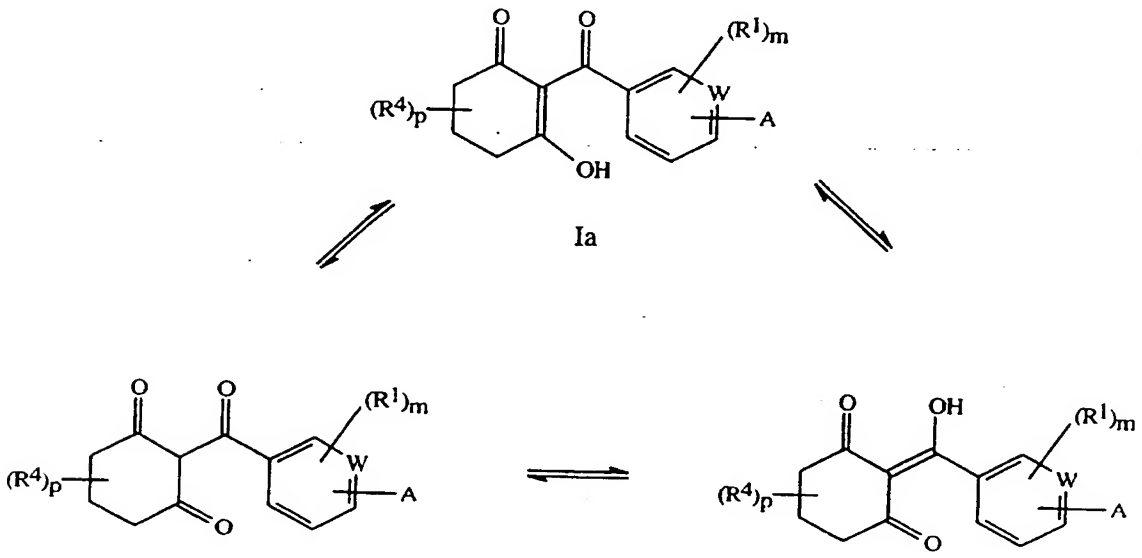
The total number of carbon atoms in a substituent group is indicated by the "C_i-C_j" prefix where i and j are numbers from 1 to 6. For example, C_1-C_3 alkylsulfonyl designates methylsulfonyl through propylsulfonyl; C_2 alkoxyalkyl designates CH_3OCH_2; C_3 alkoxyalkyl designates, for example, $CH_3CH(OCH_3)$, $CH_3OCH_2CH_2$ or $CH_3CH_2OCH_2$; and C_4 alkoxyalkyl designates the various isomers of an alkyl group substituted with an alkoxy group containing a total of four carbon atoms, examples including $CH_3CH_2CH_2OCH_2$ and $CH_3CH_2OCH_2CH_2$. Examples of "alkylcarbonyl" include $C(O)CH_3$, $C(O)CH_2CH_2CH_3$ and $C(O)CH(CH_3)_2$. Examples of "alkoxycarbonyl" include $CH_3OC(=O)$, $CH_3CH_2OC(=O)$, $CH_3CH_2CH_2OC(=O)$, $(CH_3)_2CHOC(=O)$ and the different butoxy- or pentoxycarbonyl isomers. In the above recitations, when a compound of Formula I is comprised of one or more heterocyclic rings, all substituents are attached to these rings through any available carbon or nitrogen by replacement of a hydrogen on said carbon or nitrogen.

When a group contains a substituent which can be hydrogen, for example R^1 or R^{14}, then, when this substituent is taken as hydrogen, it is recognized that this is equivalent to said group being unsubstituted.

Compounds of this invention can exist as one or more stereoisomers. The various stereoisomers include enantiomers, diastereomers, atropisomers and geometric isomers. One skilled in the art will appreciate that one stereoisomer may be more active and/or may exhibit beneficial effects when enriched relative to the other stereoisomer(s) or when separated from the other stereoisomer(s). Additionally, the skilled artisan knows how to separate, enrich, and/or to selectively prepare said stereoisomers. Accordingly, the present invention comprises compounds selected from Formula I, *N*-oxides and

agriculturally suitable salts thereof. The compounds of the invention may be present as a mixture of stereoisomers, individual stereoisomers, or as an optically active form.

Some compounds of this invention can exist as one or more tautomers. One skilled in the art will recognize, for example, that compounds of Formula Ia (Formula I where Q is Q-1, R^3 is OR^{14}, and R^{14} is H) can also exist as the tautomers of Formulae Ib and Ic as shown below. One skilled in the art will recognize that said tautomers often exist in equilibrium with each other. As these tautomers interconvert under environmental and physiological conditions, they provide the same useful biological effects. The present invention includes mixtures of such tautomers as well as the individual tautomers of compounds of Formula I.



Ia

Ib

Ic

The salts of the compounds of the invention include acid-addition salts with inorganic or organic acids such as hydrobromic, hydrochloric, nitric, phosphoric, sulfuric, acetic, butyric, fumaric, lactic, maleic, malonic, oxalic, propionic, salicylic, tartaric, 4-toluenesulfonic or valeric acids. The salts of the compounds of the invention also include those formed with organic bases (e.g., pyridine, ammonia, or triethylamine) or inorganic bases (e.g., hydrides, hydroxides, or carbonates of sodium, potassium, lithium, calcium, magnesium or barium) when the compound contains an acidic group such as a carboxylic acid or enol. Preferred salts include the lithium, sodium, potassium, triethylammonium, and quaternary ammonium salts of the compounds of the invention.

Preferred compounds for reasons of better activity and/or ease of synthesis are:

Preferred 1. Compounds of Formula I, and *N*-oxides and agriculturally-suitable salts thereof, wherein:

A is selected from the group 1*H*-pyrrolyl; furanyl; thienyl; 1*H*-pyrazolyl; 1*H*-imidazolyl; isoxazolyl; oxazolyl; isothiazolyl; thiazolyl; 1*H*-1,2,3-triazolyl; 2*H*-1,2,3-triazolyl; 1*H*-1,2,4-triazolyl; 4*H*-1,2,4-triazolyl; 1,2,3-oxadiazolyl; 1,2,4-oxadiazolyl; 1,2,5-oxadiazolyl; 1,3,4-oxadiazolyl; 1,2,3-thiadiazolyl; 1,2,4-thiadiazolyl; 1,2,5-thiadiazolyl; 1,3,4-thiadiazolyl; 1*H*-tetrazolyl; 2*H*-tetrazolyl; pyridinyl; pyridazinyl; pyrimidinyl; pyrazinyl; 1,3,5-triazinyl; 1,2,4-triazinyl; and A may optionally be substituted by one to three R^2, provided that when a nitrogen atom of a heterocyclic ring is substituted with R^2, then R^2 is other than halogen;

Preferred 2. Compounds of Preferred 1 wherein:

Q is Q-1.

Preferred 3. Compounds of Preferred 2 wherein:

each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;

R^3 is OR^{14}; and

R^{14} is H or C_1-C_4 alkylsulfonyl; or R^{14} is benzoyl or phenylsulfonyl, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro.

Preferred 4. Compounds of Preferred 3 wherein:

A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;

R^2 is $-(Y)_t$-$S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;

R^{15} is C_1-C_6 alkyl;

t is 0; and

n is 2.

Preferred 5. Compounds of Preferred 1 wherein:

Q is Q-2;

Preferred 6. Compounds of Preferred 5 wherein:

each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;

R^5 is OR^{14};

R^{14} is H or C_1-C_4 alkylsulfonyl; or R^{14} is benzoyl or phenylsulfonyl, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro.

R^6 is H, C_1-C_6 alkyl, or C_3-C_6 alkenyl; and

R^7 is H;

Preferred 7. Compounds of Preferred 6 wherein:

A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;

R^2 is $-(Y)_t$-$S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;

R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

Preferred 8. Compounds of Preferred 1 wherein:
Q is Q-3.

Preferred 9. Compounds of Preferred 8 wherein:
each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;
R^8 is H, C_1-C_3 alkyl, or cyclopropyl; and
R^9 is H or C_2-C_3 alkoxycarbonyl.

Preferred 10. Compounds of Preferred 9 wherein:
A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;
R^2 is $-(Y)_t-S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;
R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

Preferred 11. Compounds of Preferred 1 wherein:
Q is Q-4.

Preferred 12. Compounds of Preferred 11 wherein:
each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;
R^{10} is C_3-C_6 cycloalkyl or C_3-C_6 halocycloalkyl, each optionally substituted with 1-4 C_1-C_3 alkyl; and
R^{11} is cyano or C_2-C_6 alkoxycarbonyl.

Preferred 13. Compounds of Preferred 12 wherein:
A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;
R^2 is $-(Y)_t-S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;
R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

Most preferred are compounds of Formula Ia above, and sodium, potassium, and quaternary ammonium salts thereof, selected from the group:

a) 3-hydroxy-2-[[6-(trifluoromethyl)[2,4'-bipyridin]-3-yl]carbonyl]-2-cyclohexen-1-one;

b) 2-[2-chloro-4-(4-pyridinyl)benzoyl]-3-hydroxy-2-cyclohexen-1-one; and

c) 2-[2,5-dimethyl-3-(1-methyl-1*H*-pyrazol-3-yl)-4-(methylsulfonyl)benzoyl]-3-hydroxy-2-cyclohexen-1-one.

This invention also relates to herbicidal compositions comprising herbicidally effective amounts of the compounds of the invention and at least one of a surfactant, a

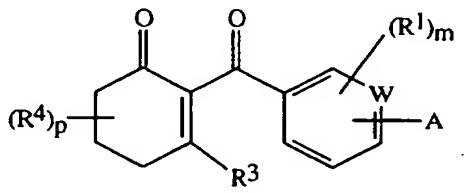
solid diluent or a liquid diluent. The preferred compositions of the present invention are those which comprise the above preferred compounds.

This invention also relates to a method for controlling undesired vegetation comprising applying to the locus of the vegetation herbicidally effective amounts of the compounds of the invention (e.g., as a composition described herein). The preferred methods of use are those involving the above preferred compounds.

DETAILS OF THE INVENTION

The compounds of Formula I can be prepared by one or more of the following methods and variations as described in Schemes 1-22. The definitions of W, Y, A, R^1-R^{16}, m, n, p, r, and t in the compounds of Formulae 1-22 below are as defined above in the Summary of the Invention. Compounds of Formulae Ia-Ig are various subsets of the compounds of Formula I, and all substituents for Formulae Ia-Ig are as defined above for Formula I.

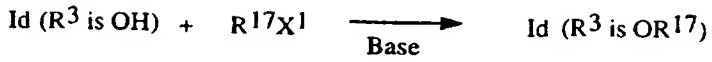
Compounds of General Formula Id can be readily prepared by one skilled in the art by using the reactions and techniques described in Schemes 1-14 of this section as well as by following the specific procedures given in Example 1.



Id

Scheme 1 illustrates the preparation of compounds of Formula Id (R^3 is OR^{17} and R^{17} is the same as R^{14} as described in the Summary of the Invention excluding H) whereby a compound of Formula Id (R^3 is OH) is reacted with a reagent of Formula 1 in the presence of a base wherein X^1 is chlorine, bromine, fluorine, trifluorosulfonyloxy (OTf) or acetyloxy (OAc) and R^{17} is as previously defined. The coupling is carried out by methods known in the art (or by slight modification of these methods): for example, see K. Nakamura, et al., WO 95/04054.

Scheme 1

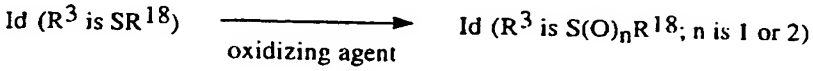


1

wherein R^{17} is the same as R^{14} as described in the Summary of the Invention excluding H; X^1 is chlorine, bromine, fluorine, trifluorosulfonyloxy (OTf) or acetyloxy (OAc)

Scheme 2 illustrates the preparation of compounds of Formula Id (R^3 is SO_nR^{18}; n is 1 or 2; and R^{18} is C_1-C_6 alkyl or C_1-C_6 haloalkyl) whereby a compound of Formula Id (R^3 is SR^{18}) is reacted with an oxidizing reagent such as peroxyacetic acid, *m*-chloroperoxybenzoic acid, potassium peroxymonosulfate (e.g., Oxone®, available from Aldrich Chemical Company), or hydrogen peroxide (the reaction may be buffered with a base such as sodium acetate or sodium carbonate). The oxidation is carried out by methods known in the art (or by slight modification of these methods): for example, see B. M. Trost, et al., *J. Org. Chem.* (1988), *53*, 532; B. M. Trost, et al., *Tetrahedron Lett.* (1981), *21*, 1287; S. Patai, et al., *The Chemistry of Sulphones and Sulphoxides*, John Wiley & Sons, Protecting and deprotecting functional groups not compatible with the reaction condition may be necessary for compounds with such a functional group (for procedures, see T. W. Greene, et al., *Protective Groups in Organic Synthesis*, Second Edition, John Wiley & Sons, Inc.).

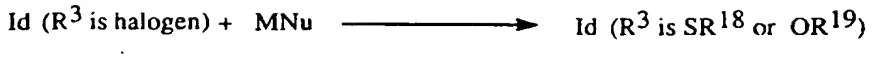
Scheme 2



wherein R^{18} is C_1-C_6 alkyl or C_1-C_6 haloalkyl

Compounds of Formula Id (R^3 is Nu; Nu is SR^{18}or OR^{19}; R^{18} is as defined previously ; R^{19} is C_1-C_6 alkyl, C_1-C_6 haloalkyl or C_2-C_6 alkoxyalkyl) can be prepared by one skilled in the art from a compound of Formula Id (R^3 is halogen) by treatment with a nucleophile of Formula 2 (Nu is SR^{18}or OR^{19}; M is Na, K or Li) as shown in Scheme 3 using methods well documented in the literature (or slight modification of these methods): for example, see S. Miyano, et al., *J. Chem. Soc., Perkin Trans. 1* (1976), 1146.

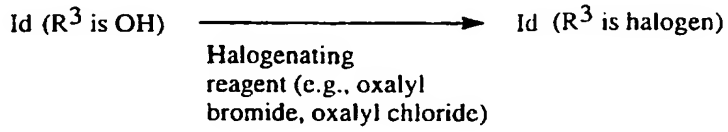
Scheme 3



wherein Nu is SR^{18} or OR^{19}; M is Na, K or Li; and R^{19} is C_1-C_6 alkyl, C_1-C_6 haloalkyl or C_2-C_6 alkoxyalkyl

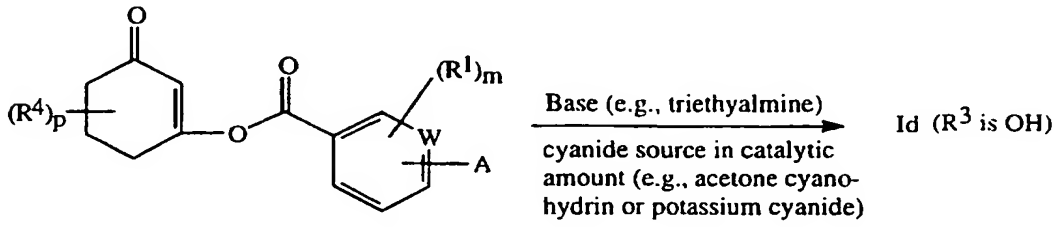
Compounds of Formula Id (R^3 is halogen) can be prepared by reacting a compound of Formula Id (R^3 is OH) with a halogenating reagent such as oxalyl bromide or oxalyl chloride (Scheme 4). This conversion is carried out by methods known in the art (or by slight modification of these methods): for example see S. Muller, et al., WO 94/13619; S. Muller, et al., DE 4,241,999.

Scheme 4



Scheme 5 illustrates the preparation of compounds of Formula Id (R^3 is OH). whereby an enol ester of Formula 3 is reacted with a base such as triethylamine in the presence of a catalytic amount of cyanide source (e.g., acetone cyanohydrin or potassium cyanide). This rearrangement is carried out by methods known in the art (or by slight modification of these methods): for example see W. J. Michaely, EP 369,803.

Scheme 5

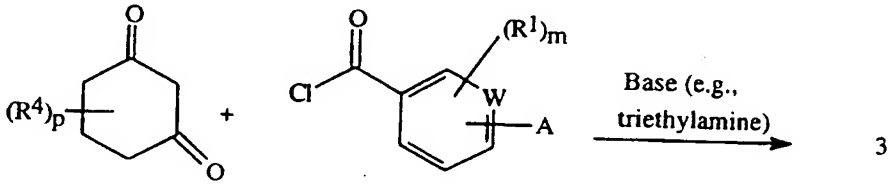


3

Enol esters of Formula 3 can be prepared by reacting a dione of Formula 4 with an acid chloride of Formula 5 in the presence of a slight mole excess of a base such as triethylamine in an inert organic solvent such as acetonitrile, methylene chloride or

toluene at temperatures between 0 °C and 110 °C (Scheme 6). This type of coupling is known in the art: for example, see W. J. Michaely, EP 369,803.

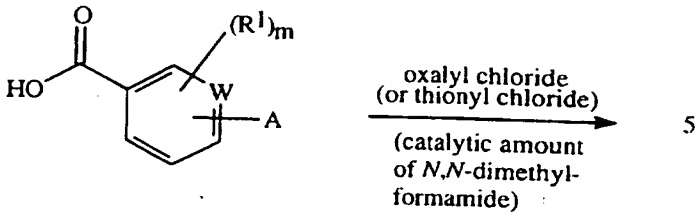
Scheme 6



4 5 3

The acid chlorides of Formula 5 can be prepared by one skilled in the art by reacting an acid of Formula 6 with oxalyl chloride (or thionyl chloride) and a catalytic amount of dimethylformamide (Scheme 7). This chlorination is well known in the art: for example, see W. J. Michaely, EP 369,803.

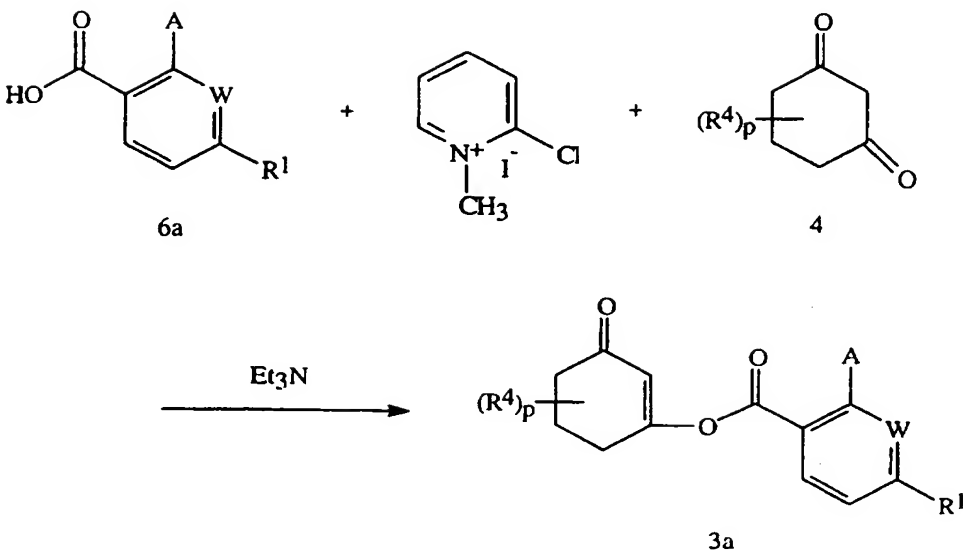
Scheme 7



6 5

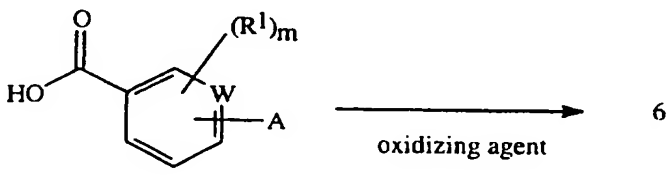
Enol esters of Formula 3a can also be prepared by directly reacting the acid of Formula 6a with *N*-methyl-2-chloropyridinium iodide, followed by treatment of the formed intermediate with the dione of Formula 4 in the presence of a base such as triethylamine (Scheme 8). This coupling is carried out be methods known in the art (or by slight modification of these methods): for example, see E. Haslam *Tetrahedron* (1980), *36*, 2409-2433.

Scheme 8



Scheme 9 illustrates the preparation of acids of Formula 6 (R^1 is $S(O)_nR^{15}$ and n is 1 or 2) whereby an acid of Formula 6 (R^1 is SR^{15}) is reacted with an oxidizing reagent such as peroxyacetic acid, *m*-chloroperoxybenzoic acid, Oxone®, or hydrogen peroxide (the reaction may be buffered with a base such as sodium acetate or sodium carbonate). The oxidation is carried out by methods known in the art (or by slight modification of these methods): for example, see B. M. Trost, et al., *J. Org. Chem.* (1988), *53*, 532; B. M. Trost, et al., *Tetrahedron Lett.* (1981), *21*, 1287; S. Patai, et al., *The Chemistry of Sulphones and Sulphoxides*, John Wiley & Sons. For some acids of Formula 6 (R^1 is SR^{15}) with a functional group not compatible with the reaction conditions, the functional group may be protected before the oxidation and then be deprotected after the oxidation. The protecting and deprotecting procedures are well known in the literature: for example see T. W. Greene, et al., *Protective Groups in Organic Synthesis* (Second Edition), John Wiley & Sons, Inc.

Scheme 9



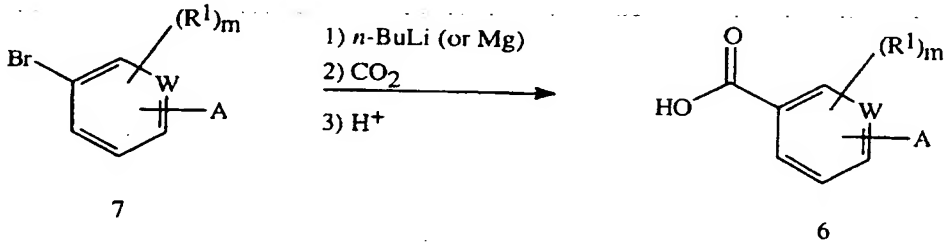
6

wherein R^1 is $S(O)_nR^{15}$ and n is 0

wherein R^1 is $S(O)_nR^{15}$ and n is 1 or 2

Scheme 10 illustrates the preparation of acids of Formula 6 (n is 0 if R^1 is $S(O)_nR^{15}$) whereby a phenyl bromide of Formula 7 (n is 0 if R^1 is $S(O)_n R^{15}$) is treated with *n*-butyllithium (or magnesium) and the lithium salt (or the Grignard reagent) generated *in situ* is then reacted with carbon dioxide followed by acidification with an acid such as hydrochloric acid. This conversion is carried out by methods known in the art (or by slight modification of these methods): for example, see M. A. Ogliaruso, et al., *Synthesis of Carboxylic Acids, Esters and Their Derivatives*, pp 27-28, John Wiley & Sons; A. J. Bridges, et al., *J. Org. Chem.* (1990), *55*, 773; C. Franke, et al., *Angew. Chem. Int. Ed.* (1969), *8*, 68. Protecting and deprotecting functional groups not compatible with the reaction conditions may be necessary for compounds with such a functional group.

Scheme 10

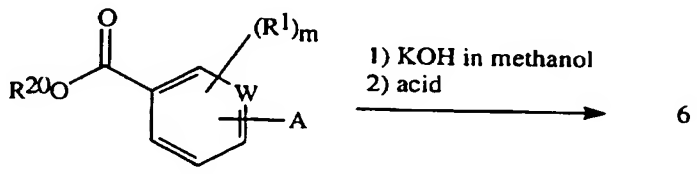


7 6

wherein W is CH, and if R^1 is $S(O)_nR^{15}$, then n is 0

Many acids of Formula 6 can also be prepared, as shown in Scheme 11, whereby an ester of Formula 8 is saponified (for example, potassium hydroxide in methanol, then acidification with an acid such as hydrochloric acid), or, alternatively, hydrolyzed in acid (for example, 5*N* hydrochloric acid in acetic acid) by methods known in the art (or slight modification of these methods); see for example, M. A. Ogliaruso, et al., *Synthesis of Carboxylic Acids, Esters and Their Derivatives*, John Wiley & Sons, (1991), pages 5-7.

Scheme 11



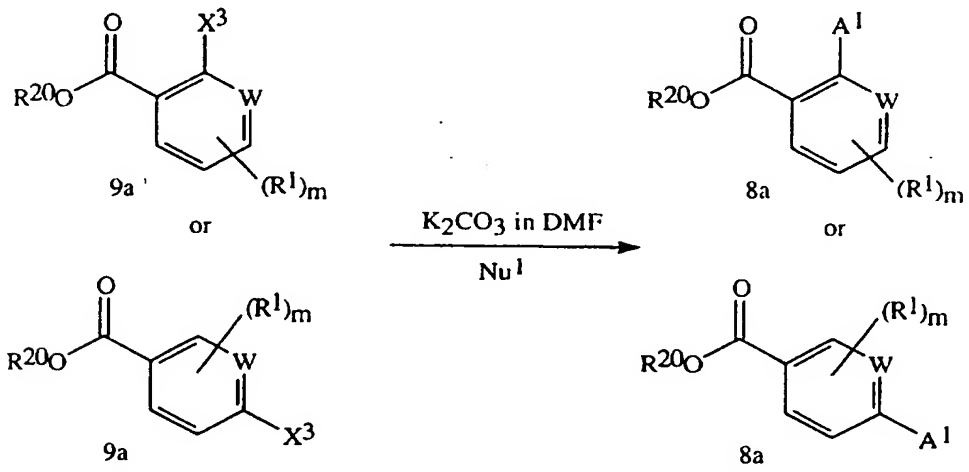
8

wherein R^{20} is CH_3 or CH_2CH_3

Esters of Formula 8 can be prepared using methods known in the art (or by slight modification of these methods): for example, see A. R. Katritzky, et al., *Comprehensive Heterocyclic Chemistry*, volumes 2-6, Pergamon Press.

Esters of Formula 8a or 8b can also be prepared as shown in Scheme 12, whereby an ester of Formula 9a or 9b is contacted with an appropriate nucleophilic heterocycle Nu^1 and a suitable base in an inert solvent. This reaction can be carried out by a variety of well-known methods, preferably with potassium carbonate or potassium *tert*-butoxide as the base with *N*,*N*-dimethylformamide as the solvent and at a reaction temperature range of from approximately 0 to 100 °C.

Scheme 12



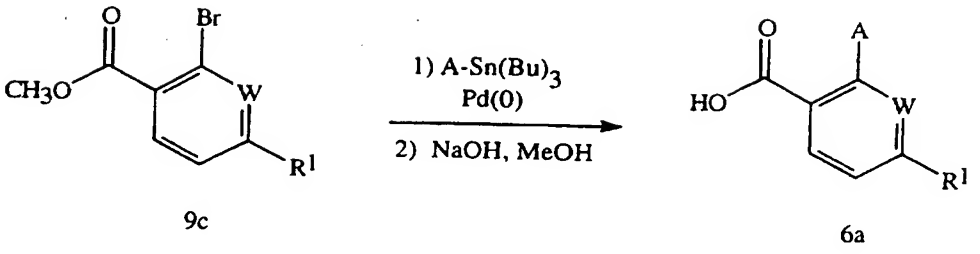
wherein X^3 is Cl, F or CF_3SO_2O;
Nu^1 is an imidazole, pyrazole or triazole

wherein A^1 is 1*H*-imidazole, 1*H*-pyrazole, 1*H*-1,2,4-triazole or 4*H*-1,2,4-triazole

Esters of Formula 9a and 9b are commercially available or can be prepared using methods known in the art (or by slight modification of these methods).

Scheme 13 illustrates the preparation of acids of Formula 6a whereby an aryl bromide of Formula 9c is treated with an aryl tin reagent in the presence of a palladium catalyst. This conversion is carried out by methods known in the art (or by slight modification of these methods): for example, see M. Fujta, et al., *Tetrahedron Letters*, (1995), *29*, 5247-5250; Y. Yamamoto, et al., *Heterocycles*, (1996), *42*, 189-194. Saponification of the ester with a base such as sodium hydroxide provides the acids of Formula 6a.

Scheme 13



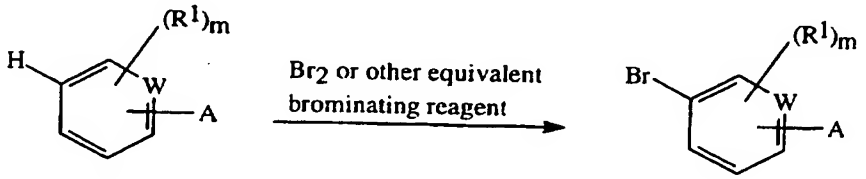
9c 6a

Bromides of Formula 9c are either commercially available or can easily be prepared by methods known in the art (or by slight modification of these methods): for example, see T. Bryson, et al., *J. Org. Chem.*, (1976), *41*, 2066; Andrea, T. A. and Liang, P. H., U.S. 5,393,734. Aryl and heteroaryl organotin compounds can be prepared by methods known in the art (or by slight modification of these methods): for example, see D. Peters, et al., *J. Heterocyclic Chem.*, (1990), *27*, 2165.

Bromides of Formula 7 (n is 0 if R^1 is $S(O)_n R^{15}$) can be prepared by one skilled in the art by using methods known in the art (or by slight modification of these methods): for example, see A. R. Katritzky, et al., *Comprehensive Heterocyclic Chemistry*, Volume 2-6, Pergamon Press; B. M. Lynch, et al., *Tet. Lett.* (1964), p. 617; M. A. Kahn, et al., *Rev. Latinoam. Quim.* (1972), *3*, p. 119; M. Kosugi, et al., *Bull. Chem. Soc. Jpn.* (1986), *59* (2), p. 677.

Alternatively some of the bromides of Formula 7 (n is 0 if R^1 is $S(O)_nR^{15}$) can also be prepared by bromination of the corresponding substituted benzenes of Formula 8 (n is 0 if R^1 is $S(O)_nR^{15}$) with the bromine or other equivalent reagent in an inert organic solvent as shown in Scheme 14. This bromination is carried out by general methods known in the art; see, for example, E. Campaigne, et al., *J. Heterocycl. Chem.* (1969), *6*, p. 517; H. Gilman, *J. Am. Chem. Soc.* (1955), *77*, p. 6059;

Scheme 14

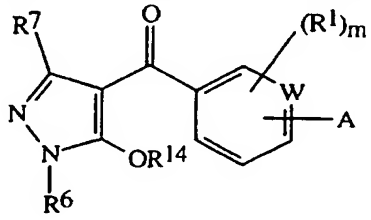


8 7

The compounds of Formula 8 (n is 0 if R^1 is $S(O)_nR^{15}$) can be prepared by one skilled in the art by using methods known in the art (or by slight modification of these methods): for example, see A. R. Katritzky, et. al., *Comprehensive Heterocyclic Chemistry*, Volume 2-6, Pergamon Press; B. M. Lynch, et al., *Tet. Lett.* (1964), p. 617;

M. A. Kahn, et al., *Rev. Latinoam. Quim.* (1972), *3*, p. 119; M. Kosugi, et al., *Bull. Chem. Soc. Jpn.* (1986), *59*, (2), p. 677.

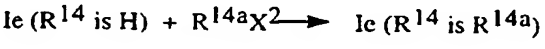
Compounds of General Formula Ie can be readily prepared by one skilled in the art by using the reactions and techniques described in Schemes 15-17 of this section.



Ie

Scheme 15 illustrates the preparation of compounds of Formula Ie (R^{14} is R^{14a} and R^{14a} is the same as R^{14} as described in the Summary of the Invention excluding H) whereby a compound of Formula Ie (R^{14} is H) is reacted with a reagent of Formula 9 in the presence of a base wherein X^2 is chlorine, bromine, fluorine, OTf or OAc and R^{14a} is as previously defined. This coupling is carried out by methods known in the art (or by slight modification of these methods): for example, see K. Nakamura, et al., WO 95/04054.

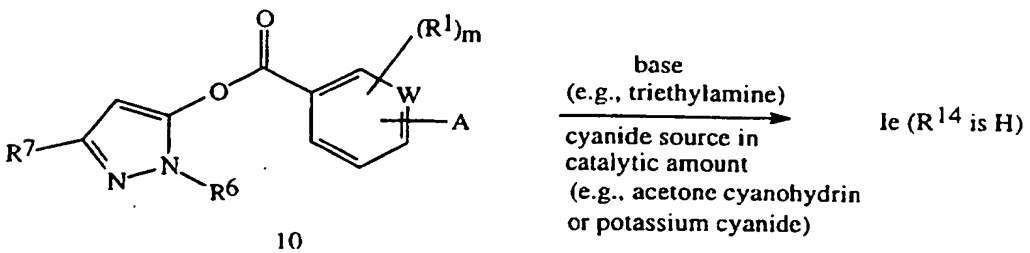
Scheme 15



9

Scheme 16 illustrates the preparation of compounds of Formula Ie (R^{14} is H). whereby an ester of Formula 10 is reacted with a base such as triethylamine in the presence of a catalytic amount of cyanide source (e.g., acetone cyanohydrin or potassium cyanide). This rearrangement is carried out by methods known in the art (or by slight modification of these methods): for example, see W. J. Michaely, EP 369,803.

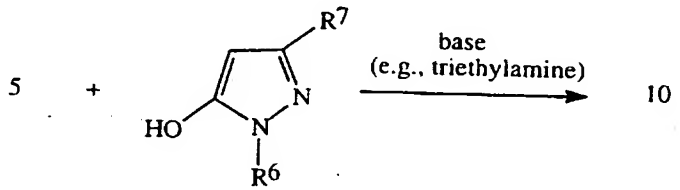
Scheme 16



10

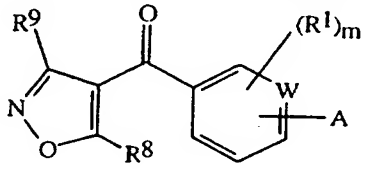
Esters of Formula 10 can be prepared by reacting a hydroxypyrazole of Formula 11 with an acid chloride of Formula 5 in the presence of a slight mole excess of a base such as triethylamine in an inert organic solvent such as acetonitrile, methylene chloride or toluene at temperatures between 0 °C and 110 °C (Scheme 17). This type of coupling is carried out by methods known in the art (or by slight modification of these methods): for example, see W. J. Michaely, EP 369,803.

Scheme 17



11

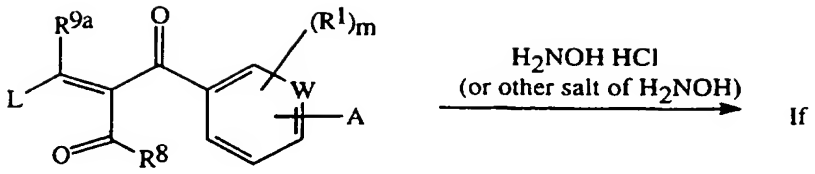
Compounds of General Formula If can be readily prepared by one skilled in the art by using the reactions and techniques described in Schemes 18-21 of this section.



If

Scheme 18 illustrates the preparation of compounds of Formula If whereby a compound of Formula 12 is reacted with a salt of hydroxylamine such as hydroxylamine hydrochloride in the presence of a base or acid acceptor such as triethylamine or sodium acetate. The substituents of the immediate products may be further modified if appropriate. This cyclization is carried out by methods known in the art (or by slight modification of these methods): for example, see P. A. Cain, et al., EP 560,483; C. J. Pearson, et al., EP 636,622.

Scheme 18

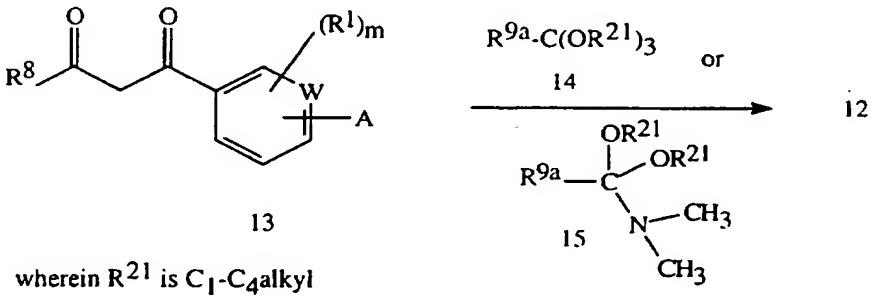


12

wherein
L is a leaving group such as C_1-C_4alkoxy (e.g. OC_2H_5) or *N,N*-dialkylamino (e.g. dimethyl amino)
R^{9a} is R^9 or $CONH_2$

Scheme 19 illustrates the preparation of compounds of Formula 12 whereby a compound of Formula 13 is reacted with a reagent of Formula 14 or Formula 15. This conversion is carried out by methods known in the art (or by slight modification of these methods): for example, see P. A. Cain, et al., EP 560,483; C. J. Pearson, et al., EP 636,622.

Scheme 19

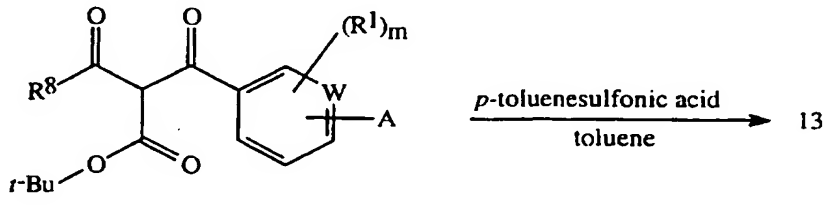


13

wherein R^{21} is C_1-C_4alkyl

Scheme 20 illustrates the preparation of compounds of Formula 13 whereby a ester of Formula 16 is decarboxylated in the presence of a catalyst, such as *p*-toluenesulfonic acid, in an inert solvent such as toluene. This conversion is carried out by methods known in the art (or by slight modification of these methods): for example, see P. A. Cain, et al., EP 560,483; C. J. Pearson, et al., EP 636,622.

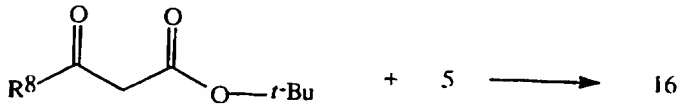
Scheme 20



16

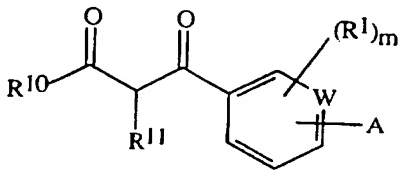
Esters of Formula 16 can be prepared by reacting the metal salt of a compound of Formula 17 with an acid chloride of Formula 5 (Scheme 21). This type of coupling is known in the art: for example see P. A. Cain, et al., EP 560,483; C. J. Pearson, et al., EP 636,622.

Scheme 21



17

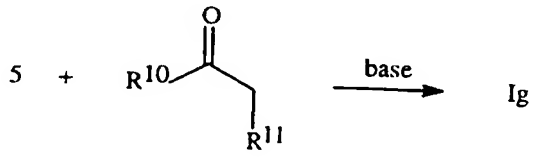
Scheme 22 illustrates the preparation of compounds of Formula Ig whereby a compound of Formula 5 is reacted with a compound of Formula 18 in the presence of a base such as triethylamine, potassium carbonate, sodium hydride or $Mg(OEt)_2$ in an inert organic solvent such as diethyl ether, tetrahydrofuran, *N,N*-dimethylformamide, dichloromethane or acetonitrile.



Ig

This conversion is carried out by methods known in the art (or slight modification of these methods); for example, see J. W. Ashmore, EP 213,892 and P. A. Caln, EP 496,631 A1.

Scheme 22



18

It is recognized that some reagents and reaction conditions described above for preparing compounds of Formula I may not be compatible with certain functionalities present in the intermediates. In these instances, the incorporation of protection/deprotection sequences or functional group interconversions into the

synthesis will aid in obtaining the desired products. The use and choice of the protecting groups will be apparent to one skilled in chemical synthesis (see, for example, Greene, T. W.; Wuts, P. G. M. *Protective Groups in Organic Synthesis*, 2nd ed.; Wiley: New York, 1991). One skilled in the art will recognize that, in some cases, after the introduction of a given reagent as it is depicted in any individual scheme, it may be necessary to perform additional routine synthetic steps not described in detail to complete the synthesis of compounds of Formula I. One skilled in the art will also recognize that it may be necessary to perform a combination of the steps illustrated in the above schemes in an order other than that implied by the particular sequence presented to prepare the compounds of Formula I.

One skilled in the art will also recognize that compounds of Formula I and the intermediates described herein can be subjected to various electrophilic, nucleophilic, radical, organometallic, oxidation, and reduction reactions to add substituents or modify existing substituents.

Without further elaboration, it is believed that one skilled in the art using the preceding description can utilize the present invention to its fullest extent. The following Examples are, therefore, to be construed as merely illustrative, and not limiting of the disclosure in any way whatsoever. Percentages are by weight except for chromatographic solvent mixtures or where otherwise indicated. Parts and percentages for chromatographic solvent mixtures are by volume unless otherwise indicated. ^{1}H NMR spectra are reported in ppm downfield from tetramethylsilane; s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, dd = doublet of doublets, dt = doublet of triplets, br s = broad singlet.

EXAMPLE 1

Step A: Preparation of 3-[(2,5-dimethylphenyl)thio]propanoic acid

43.4 g (1.086 mol) of sodium hydroxide was added to 230 mL of water, 75.0 g (0.543 mol) of 2,5-dimethylthiophenol (purchased from Aldrich Chemical Company) was then added and the mixture was cooled to about 10 °C. 91.30 g (0.597 mol) of 3-bromopropionic acid (purchased from Aldrich Chemical Company) was added in portions keeping the temperature below 25 °C. The mixture was warmed to room temperature, stirred for 2 hr under nitrogen, and was then washed with diethyl ether (3 x 500 mL). The aqueous layer was acidified with 1N HCl and filtered to yield 112.79 g of the title compound of step A as a solid, m.p. 97-98 °C.

^{1}H NMR ($CDCl_3$): δ 2.3 (s, 3H), 2.34 (s, 3H), 2.68 (t, 2H), 3.1 (t, 2H), 6.9 (d, 1H), 7.06-7.14 (2H).

Step B: Preparation of 2,3-dihydro-5,8-dimethyl-4*H*-1-benzopyran-4-one

530 mL of concentrated sulfuric acid was added to 24.91 g (0.119 mol) of the title compound of step A while being cooled with an acetone/ice bath. The ice bath was

removed, the mixture was stirred for 1 hr and was then poured over crushed ice. The aqueous phase was extracted with a mixture of diethyl ether : hexane (1:9, 6 x 500 mL), dried ($MgSO_4$), filtered, and evaporated to dryness to yield 11.75 g of the title compound of step B as an oil.

^1H NMR ($CDCl_3$): δ 2.3 (s, 3H), 2.6 (s, 3H), 2.97 (m, 2H), 3.2 (m, 2H), 6.9-7.1 (2H).

Step C: Preparation of 6-bromo-2,3-dihydro-5,8-dimethyl-4*H*-1-benzothiopyran-4-one

A solution of 4.07 g (0.021 mol) of the title compound of step B in 25 mL of methylene chloride was added dropwise to a mixture of 7.07 g (0.053 mol) of aluminum chloride (purchased from Aldrich Chemical Company) in 25 mL of methylene chloride. The suspension was stirred for approximately 15 minutes, 1.14 mL (0.022 mol) of bromine (purchased from Janssen) was added dropwise, and the mixture was then refluxed for 10 minutes. The warm mixture was poured into 10 mL of concentrated hydrochloric acid containing 75 g of ice, stirred for 10 minutes, diluted with 50 mL of water, and extracted with diethyl ether (2 x 200 mL). The combined organic layers were washed with water (2 x 200 mL), dried (Na_2SO_4), filtered, and evaporated to dryness. The crude product was chromatographed over silica gel eluting with a mixture of ethyl acetate : hexane (5:95) to yield 2.62 g of the title compound of step C as a solid, m.p. 87-88 °C.

^1H NMR ($CDCl_3$): δ 2.3 (s, 3H), 2.6 (s, 3H), 3.0 (m, 2H), 3.2 (m, 2H), 7.45 (s, 1H).

Step D: Preparation of 6-bromo-5,8-dimethyl-4*H*-1-benzothiopyran-4-one

30 g (0.11 mol) of the title compound of step C and 8.95 mL (0.11 mol) of pyridine were added to 250 mL of methylene chloride. The solution was cooled to about 0 °C and 14.76 g (0.11 mol) of N-chlorosuccinimide was added. The mixture was stirred overnight under nitrogen while warming to room temperature and then refluxed for 12 h. The reaction was evaporated to dryness, the residue was stirred in diethyl ether, and filtered. The filtrate was dried ($MgSO_4$), filtered, and evaporated to dryness to yield 13.25 g of the title compound of step D as a solid, m.p. 123-124 °C.

^1H NMR ($CDCl_3$): δ 2.5 (s, 3H), 2.9 (s, 3H), 7.0 (d, 1H), 7.7 (m, 2H).

Step E: Preparation of 3-[3-bromo-2,5-dimethyl-6-(methylthio)phenyl]-1-methyl-1*H*-pyrazole

13.25 g (0.049 mol) of the title compound of step D and 2.88 mL (0.054 mol) of methylhydrazine (purchased from Aldrich Chemical Company) was added to 150 mL of absolute ethanol. After stirring at reflux under nitrogen for 5 hr the mixture was allowed to warm to room temperature and stir for 2.5 days. The mixture was refluxed for 3 hr after which time 0.5 mL of acetic acid was added and the reaction was refluxed

overnight. After cooling to room temperature, 12.35 mL (0.054 mol) of sodium methoxide (25% in methanol) and 3.66 mL (0.059 mol) of iodomethane were added and the reaction stirred for 2 hr. The mixture was evaporated to dryness. The residue was stirred in water, extracted with methylene chloride (250 mL), dried ($MgSO_4$), filtered, and evaporated to dryness. The crude product was chromatographed over silica gel eluting with methylene chloride to yield 5.97 g of the title compound of step E as an oil.

^1H NMR ($CDCl_3$): δ 2.0 (s, 3H), 2.1 (s, 3H), 2.5 (s, 3H), 3.6 (s, 3H), 6.2 (s, 1H), 7.6 (m, 2H).

Step F: Preparation of 2,5-dimethyl-3-(1-methyl-1*H*-pyrazol-3-yl)-4-(methylthio)benzoic acid

5.9 g (0.019 mol) of the title compound of step E was added to 100 mL of tetrahydrofuran and cooled to -70 °C. 9.1 mL (0.023 mol) of 2.5M *n*-butyllithium (purchased from Aldrich Chemical Company) was added dropwise keeping the temperature below -65 °C. Solid carbon dioxide was added in one portion and the mixture warmed to room temperature. 200 mL of hexane was added and the mixture was filtered. The solid collected was added to water and acidified to about pH 1 with concentrated hydrochloric acid. The aqueous was extracted with methylene chloride (3 x 100 mL), dried ($MgSO_4$), filtered, and evaporated to dryness to yield 3.13 g of the title compound of step F as a semi-solid.

^1H NMR ($CDCl_3$): δ 2.1 (s, 3H), 2.3 (s, 3H), 2.6 (s, 3H), 3.6 (s, 3H), 6.2 (m, 1H), 7.6 (d, 1H), 7.97 (s, 1H).

Step G: Preparation of 2,5-dimethyl-3-(1-methyl-1*H*-pyrazol-3-yl)-4-(methylsulfonyl)benzoic acid

4.5 mL (0.046 mol) of hydrogen peroxide (35%) was added to 25 mL of trifluoroacetic acid. The mixture was allowed to stir for 30 min under nitrogen and was then cooled to 0 °C. A solution of 3.1 g (0.011 mol) of the title compound of step F in 25 mL of trifluoroacetic acid was added dropwise keeping the temperature below 10 °C. The mixture was warmed to room temperature and stirred for 3 days. 2 mL of dimethylsulfide was added and the reaction stirred for 30 min. The mixture was then evaporated to dryness, and the residue was triturated with water and filtered. The collected solid was dissolved in methylene chloride, dried ($MgSO_4$), filtered, and evaporated to dryness to yield 1.41 g of the title compound of step G as a solid, m.p. 60†°C (dec.).

^1H NMR ($CDCl_3$): δ 2.2 (s, 3H), 2.8 (s, 3H), 3.0 (s, 3H), 3.7 (s, 3H), 6.2 (m, 1H), 7.7 (m, 1H), 8.0 (s, 1H).

Step H: Preparation of 3-oxo-1-cylcohexen-1-yl 2,5-dimethyl-3-(1-methyl-1*H*-pyrazol-3-yl)-4-(methylsulfonyl)benzoate

1.39 g (0.0045 mol) of the title compound of step G, 1.18 mL (0.0135 mol) of oxalyl chloride (purchased from Janssen), and 2 drops of N,N-dimethylformamide were added to 50 mL of methylene chloride. The mixture was refluxed under nitrogen for 2.5 hr and was then evaporated to dryness. 50 mL of methylene chloride was added to the residue and the solution was again evaporated to dryness. Another 50 mL of methylene chloride was added to the residue, and the solution was cooled to about 0 °C. 0.56 g (0.0049 mol) of 1,3-cyclohexanedione (purchased from Aldrich Chemical Company) was added followed by 1.94 mL (0.0139 mol) of triethylamine, and the mixture was stirred overnight while warming to room temperature. The mixture was evaporated to dryness and the crude product was chromatographed over silica gel eluting with a mixture of ethyl acetate:hexane (6:4, then 7:3) to yield 0.47 g of the title compound of step H as a solid, m.p. 165 - 167 °C.

^{1}H NMR ($CDCl_3$): δ 2.1 - 2.2 (m, 5H), 2.5 (m, 2H), 2.7 (m, 2H), 2.8 (s, 3H), 2.98 (s, 3H), 3.6 (s, 3H), 6.0 (s, 1H), 6.1 (m, 1H), 7.6 (m, 1H), 7.9 (s, 1H).

Step I: Preparation of 2-[2,5-dimethyl-3-(1-methyl-1*H*-pyrazol-3-yl)-4-(methylsulfonyl)benzoyl]-1,3-cyclohexanedione

0.47 g (0.0012 mol) of the title compound of step H, 1 drop of acetone cyanohydrin (purchased from Aldrich Chemical Company), and 0.29 mL (0.0020 mol) of triethylamine were added to 25 mL of acetonitrile and allowed to stir overnight at room temperature under nitrogen. The mixture was evaporated to dryness, water was added to the residue, and the solution was acidified to pH 1 with concentrated hydrochloric acid. The aqueous was extracted with methylene chloride, dried ($MgSO_4$), filtered, and evaporated to dryness to yield 0.27 g of the title compound of example 1, a compound of the invention, as a solid, m.p. 93 °C (decomposed).

^{1}H NMR ($CDCl_3$): δ 1.8 (s, 3H), 2.1 (m, 2H), 2.4 (m, 2H), 2.7 (s, 3H), 2.8 (m, 2H), 2.98 (s, 3H), 3.7 (s, 3H), 6.2 (s, 1H), 7.1 (s, 1H), 7.6 (s, 1H).

EXAMPLE 2

Step A: Preparation of 2-[3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzoic acid

To 100 mL of dimethylformamide was added sequentially 19.3 g (0.125 mol) of methyl 2-fluorobenzoate, 18.7 g (0.138 mol) of 3-(trifluoromethyl)pyrazole (purchased from Maybridge Chemical Company), and 19.0 g (0.138 mol) of potassium carbonate. The suspension was stirred and heated at about 100 °C for 16 hours, then cooled to 25 °C and poured into excess water. The aqueous suspension was extracted three times with 75 mL of diethyl ether and the combined ether layers were dried over magnesium sulfate and concentrated under reduced pressure. The residual oil was chromatographed over silica gel eluting with hexane:ethyl acetate (9.6:0.4, then 100% ethyl acetate) to

yield 15.3 g of crude methyl 2-[3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzoate as an oil. 14 g (0.052 mol) of this oil was added to a solution of 3.8 g (0.057 mol) of potassium hydroxide (85%) dissolved in 60 mL of methanol. The solution was stirred at 25 °C for one hour, refluxed for 5 hours, stirred at 25 °C for 48 hours, and finally concentrated under reduced pressure. 100 mL of water was added to the residue and the cloudy solution was extracted twice with 40 mL of diethyl ether. The clear aqueous layer was acidified with concentrated HCl and filtered. The collected solid was dissolved in dichloromethane, dried over magnesium sulfate, and the solvent was removed under reduced pressure to yield 5.0 g of the title compound of Step A as a solid melting at 138-144 °C.

^{1}H NMR ($CDCl_3$): δ 6.95 (d, 1H), 7.65 (m, 2H), 7.7 (m, 1H), 7.85 (m, 1H), 8.35 (d, 1H), 13.15 (s, 1H).

Step B: Preparation of 3-oxo-1-cyclohexen-1-yl 2-[3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzoate

To 20 mL of oxalyl chloride was added portionwise 4.0 g of the title compound of Step A. The suspension was refluxed for about 3 hours and then concentrated under reduced pressure. The residue was azeotroped with dichloromethane (two times with 20 mL at 60 °C) to yield an oil which solidified upon cooling and melted at 64-68 °C. 2.0 g (0.0073 mol) of this acid chloride was added to 20 mL of dichloromethane, followed by the addition of 0.99 g (0.0088 mol) of 1,3-cyclohexanedione, and 2.2 g (0.022 mol) of triethylamine. The suspension was stirred overnight and then concentrated under reduced pressure. The residue was dissolved in diethyl ether and the solution was then extracted with water, dried over magnesium sulfate, and concentrated under reduced pressure to yield 2.0 g of the title compound of Step B as an oil.

^{1}H NMR ($CDCl_3$): δ 2.0 (m, 2H), 2.35 (m, 2H), 2.5 (m, 2H), 5.85 (s, 1H), 6.75 (d, 1H), 7.5 (m, 1H), 7.6 (m, 1H), 7.7 (m, 1H), 7.8 (d, 1H), 8.0 (m, 1H).

Step C: Preparation of 3-hydroxy-2-[2-[3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzoyl]-2-cyclohexen-1-one

To 20 mL of acetonitrile was added sequentially 1.8 g (0.005 mol) of the title compound of Step B, 1.0 g (0.01 mol) of triethylamine, and 8 drops of acetone cyanohydrin. The solution was stirred under a nitrogen atmosphere at 25 °C overnight, and then diluted with 40 mL of water and acidified by the addition of concentrated hydrochloric acid (red to litmus paper). The suspension was filtered, and the collected solid was washed three times with 20 mL of water, suction dried, and then recrystallized from 2-propanol to yield 0.97 g of the title compound of Step C, a compound of this invention, as a solid melting at 141-143 °C.

^{1}H NMR ($CDCl_3$): δ 1.8 (m, 2H), 2.1 (m, 2H), 2.6 (m, 2H), 6.6 (d, 1H), 7.4-7.6 (m, 4H), 7.75 (d, 1H), 16.6 (s, 1H).

EXAMPLE 3

Step A: Preparation of methyl 6-(trifluoromethyl)[2,4'-bipyridine]-3-carboxylate

To a stirred solution of 8.49 g (0.03 mol) of methyl 2-bromo-6-(trifluoromethyl)-3-pyridine carboxylate (prepared as described by Andrea T. A. and Liang P. H., U.S. Patent 5,393,734) in 25 mL of *N,N*-dimethylformamide under a nitrogen atmosphere was added 0.5 g of tetrakis(triphenylphosphine)palladium(0) and the mixture was heated at 100 °C for 30 minutes. 11 g (0.03 mol) of 4-tributylstannylpyridine (prepared by a modification of the procedure described by A. Lee and W. Dai, *Tetrahedron Letters* (1996), *37*, 495-498) was added and heating was continued at 100 °C for 24 hours. The reaction mixture was cooled to room temperature and *N,N*-dimethylformamide was removed by distillation under high vacuum. The residue was purified by flash chromatography over silica gel utilizing dichloromethane:ethyl acetate (8:2) to provide 4.0 g of the title compound of Step A as a red oil.

^{1}H NMR ($CDCl_3$): δ 8.76 (d, 2H), 8.4 (d, 1H), 7.8 (d, 1H), 7.47 (m, 2H), 3.76 (s, 3H).

Step B: Preparation of 6-(trifluoromethyl)[2,4'-bipyridine]-3-carboxylic acid

To a solution of 1.7 g of the title compound of Step A in 20 mL of methanol was added 2 mL of 50% aqueous sodium hydroxide and the reaction was stirred at room temperature for 24 hours. The mixture was concentrated and acidified with 6*N* aqueous hydrochloric acid to pH 3 and extracted three times with 20 mL of ethyl acetate. The combined organic layers were dried over magnesium sulfate and concentrated under reduced pressure to provide 1.6 g of title compound of Step B as a crude solid.

^{1}H NMR ($(CD_3)_2SO$): δ 9.02 (d, 2H), 8.26 (d, 1H), 8.22 (m, 1H), 8.14 (d, 2H).

Step C: Preparation of 3-oxo-1-cyclohexen-1-yl 6-(trifluoromethyl)[2,4'-bipyridine]-3-carboxylate

To a suspension of 1.6 g (6 mmol) of the title compound of Step B in 100 mL of dichloromethane was added 0.78 g (7 mmol) of 1,3-cyclohexanedione followed by 2.4 mL (16 mmol) of triethylamine and 1.8 g (7 mmol) of 2-chloro-1-methylpyridinium iodide. The mixture was stirred at room temperature under nitrogen for 24 hours and then applied directly to a silica gel column and purified by flash chromatography using ethyl acetate/dichloromethane (2:8) to afford 1.34 g of the title compound of Step C as a tan solid melting at 49-56 °C.

^{1}H NMR ($CDCl_3$): δ 8.78 (d, 2H), 8.6 (d, 1H), 7.51 (d, 2H), 5.93 (s, 1H), 2.2 (m, 2H), 2.1 (m, 2H), 2.0 (m, 2H).

Step D: Preparation of 3-hydroxy-2-[[6-(trifluoromethyl)[2,4'-bipyridin]-3-yl]carbonyl]-2-cyclohexen-1-one

To a solution of 1.22 g (3.5 mmol) of the title compound of Step C in 25 mL of acetonitrile was added 1.16 mL (8.36 mmol) of triethylamine, followed by 2 drops of

acetonecyanohydrin. The mixture was stirred under nitrogen for 18 hours. The mixture was then concentrated under reduced pressure, and the residual oil was acidified with aqueous 1*N* hydrochloric acid and extracted three times with 20 mL of dichloromethane. The combined organic layers were dried over magnesium sulfate and concentrated under reduced pressure to afford 0.4 g of the title compound of Step D, a compound of this invention, as a white solid melting at 137-145 °C.

^{1}H NMR ($CDCl_3$): δ 8.66 (m, 2H), 7.79 (m, 2H), 7.45 (m, 2H), 2.8 (m, 2H), 2.0 (m, 2H), 1.8 (m, 2H).

By the procedures described herein together with methods known in the art, the following compounds of Tables 1 to 20 can be prepared. The following abbreviations are used in the Tables which follow: NO_2 = nitro and Ph = phenyl.

The following notations have been used in Tables 1-20:

A-1 = (1-methyl-1*H*-pyrazol-3-yl)-

A-2 = (1-ethyl-1*H*-pyrazol-3-yl)-

A-3 = (1-propyl-1*H*-pyrazol-3-yl)-

A-4 = (1*H*-pyrazol-3-yl)-

A-5 = (1,5-dimethyl-1*H*-pyrazol-3-yl)-

A-6 = (4-chloro-1-methyl-1*H*-pyrazol-3-yl)-

A-7 = (1*H*-pyrazol-1-yl)-

A-8 = (3-methyl-1*H*-pyrazol-1-yl)-

A-9 = (3,5-dimethyl-1*H*-pyrazol-1-yl)-

A-10 = (3-isoxazolyl)-

A-11 = (5-methyl-3-isoxazolyl)-

A-12 = (3-methyl-5-isoxazolyl)-

A-13 = (5-isoxazolyl)-

A-14 = (1*H*-pyrrol-2-yl)-

A-15 = (1-methyl-1*H*-pyrrol-2-yl)-

A-16 = (1*H*-pyrrol-1-yl)-

A-17 = (1-methyl-1*H*-pyrrol-3-yl)-

A-18 = (2-furanyl)-

A-19 = (5-methyl-2-furanyl)-

A-20 = (3-furanyl)-

A-21 = (5-methyl-2-thienyl)-

A-22 = (2-thienyl)-

A-23 = (3-thienyl)-

A-24 = (1-methyl-1*H*-imidazol-2-yl)-

A-25 = (1*H*-imidazol-2-yl)-

A-26 = (1-methyl-1*H*-imidazol-4-yl)-

A-27 = (1-methyl-1*H*-imidazol-5-yl)-

A-28 = (4-methyl-2-oxazolyl)-

A-29 = (5-methyl-2-oxazolyl)-

A-30 = (2-oxazolyl)-

A-31 = (2-methyl-5-oxazolyl)-

A-32 = (2-methyl-4-oxazolyl)-

A-33 = (4-methyl-2-thiazolyl)-

A-34 = (5-methyl-2-thiazolyl)-

A-35 = (2-thiazolyl)-

A-36 = (2-methyl-5-thiazolyl)-

A-37 = (2-methyl-4-thiazolyl)-

A-38 = (3-methyl-4-isothiazolyl)-

A-39 = (3-methyl-5-isothiazolyl)-

A-40 = (5-methyl-3-isothiazolyl)-

A-41 = (1-methyl-1*H*-1,2,3-triazol-4-yl)-

A-42 = (2-methyl-2*H*-1,2,3-triazol-4-yl)-

A-43 = (4-methyl-2*H*-1,2,3-triazol-2-yl)-

A-44 = (1-methyl-1*H*-1,2,4-triazol-3-yl)-

A-45 = (1,5-dimethyl-1*H*-1,2,4-triazol-3-yl)-

A-46 = (3-methyl-1*H*-1,2,4-triazol-1-yl)-

A-47 = (5-methyl-1*H*-1,2,4-triazol-1-yl)-

A-48 = (4,5-dimethyl-4*H*-1,2,4-triazol-3-yl)-

A-49 = (4-methyl-4*H*-1,2,4-triazol-3-yl)-

A-50 = (4*H*-1,2,4-triazol-4-yl)-

A-51 = (5-methyl-1,2,3-oxadiazol-4-yl)-

A-52 = (1,2,3-oxadiazol-4-yl)-

A-53 = (3-methyl-1,2,4-oxadiazol-5-yl)-

A-54 = (5-methyl-1,2,4-oxadiazol-3-yl)-

A-55 = (4-methyl-3-furazanyl)-

A-56 = (3-furazanyl)-

A-57 = (5-methyl-1,3,4-oxadiazol-2-yl)-

A-58 = (5-methyl-1,2,3-thiadiazol-4-yl)-

A-59 = (1,2,3-thiadiazol-4-yl)-

A-60 = (3-methyl-1,2,4-thiadiazol-5-yl)-

A-61 = (5-methyl-1,2,4-thiadiazol-3-yl)-

A-62 = (4-methyl-1,2,5-thiadiazol-3-yl)-

A-63 = (5-methyl-1,3,4-thiadiazol-2-yl)-

A-64 = (1-methyl-1*H*-tetrazol-5-yl)-

A-65 = (1*H*-tetrazol-5-yl)-

A-66 = (5-methyl-1*H*-tetrazol-1-yl)-

A-67 = (2-methyl-2*H*-tetrazol-5-yl)-

A-68 = (2-ethyl-2*H*-tetrazol-5-yl)-

A-69 = (5-methyl-2*H*-tetrazol-2-yl)-

A-70 = (2*H*-tetrazol-2-yl)-

A-71 = (2-pyridinyl)-

A-72 = (6-methyl-2-pyridinyl)-

A-73 = (4-pyridinyl)-

A-74 = (3-pyridinyl)-

A-75 = (6-methyl-3-pyridazinyl)-

A-76 = (5-methyl -3-pyridazinyl)-

A-77 = (3-pyridazinyl)-

A-78 = (4,6-dimethyl-2-pyrimidinyl)-

A-79 = (4-methyl-2-pyrimidinyl)-

A-80 = (2-pyrimidinyl)-

A-81 = (2-methyl-4-pyrimidinyl)-

A-82 = (2-chloro-4-pyrimidinyl)-

A-83 = (2,6-dimethyl-4-pyrimidinyl)-

A-84 = (4-pyrimidinyl)-

A-85 = (2-methyl-5-pyrimidinyl)-

A-86 = (6-methyl-2-pyrazinyl)-

A-87 = (2-pyrazinyl)-

A-88 = (4,6-dimethyl-1,3,5-triazin-2-yl)-

A-89 = (4,6-dichloro-1,3,5-triazin-2-yl)-

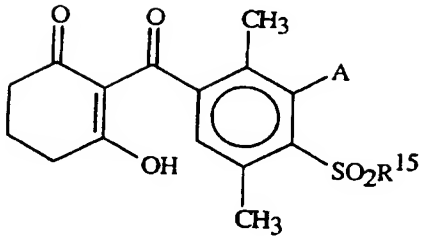
A-90 = (1,3,5-triazin-2-yl)-

A-91 = (4-methyl-1,3,5-triazin-2-yl)-

A-92 = (3-methyl-1,2,4-triazin-5-yl)-

A-93 = (3-methyl-1,2,4-triazin-6-yl)-

TABLE 1



R^{15} is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is CH_2CH_3

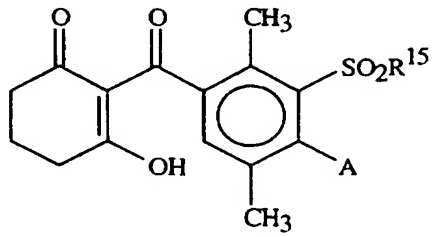
A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60

A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 2



R^{15} is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

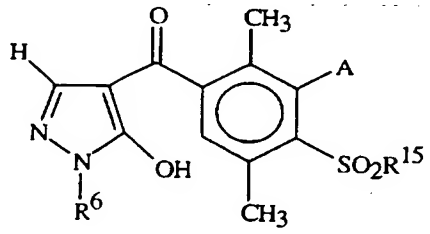
R^{15} is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 3



R^{15} is CH_3 and R^6 is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is CH_2CH_3 and R^6 is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48

A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$ and R^6 is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is CH_3 and R^6 is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

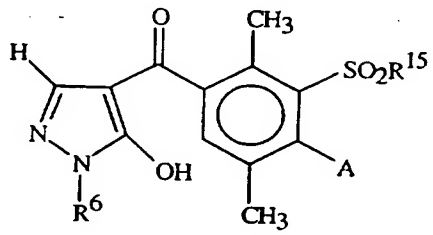
R^{15} is CH_2CH_3 and R^6 is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$ and R^6 is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 4



R^{15} is CH_3 and R^6 is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is CH_2CH_3 and R^6 is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48

A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$ and R^6 is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is CH_3 and R^6 is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

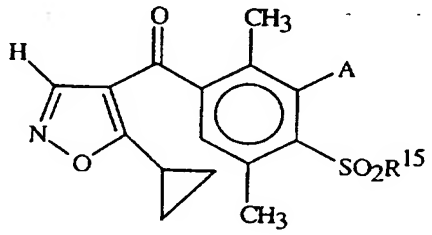
R^{15} is CH_2CH_3 and R^6 is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$ and R^6 is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 5



R^{15} is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is CH_2CH_3

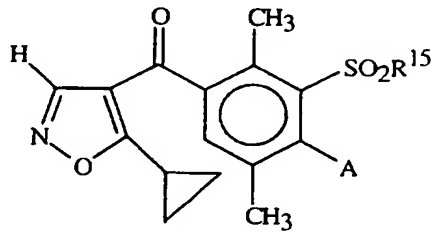
A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48

A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 6



R^{15} is CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

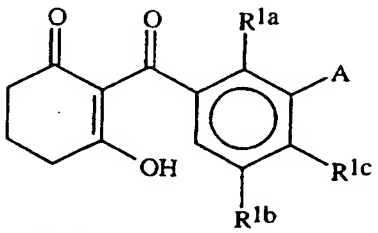
R^{15} is CH_2CH_3

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{15} is $CH_2CH_2CH_3$

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 7



A	R^{1c}	R^{1a}	R^{1b}	A	R^{1c}	R^{1a}	R^{1b}
A-1	SO_2CH_3	NO_2	CH_3	A-2	SO_2CH_3	NO_2	CH_3
A-1	SO_2CH_3	Cl	CH_3	A-2	SO_2CH_3	Cl	CH_3
A-1	SO_2CH_3	Cl	Cl	A-2	SO_2CH_3	Cl	Cl
A-1	$SO_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_3$	Cl	Cl

A-1	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-1	$SO_2N(CH_3)_2$	CH_3	CH_3	A-2	$SO_2N(CH_3)_2$	CH_3	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	CH_3	A-2	$SO_2N(CH_3)_2$	Cl	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	Cl	A-2	$SO_2N(CH_3)_2$	Cl	Cl
A-1	SO_2CF_3	CH_3	CH_3	A-2	SO_2CF_3	CH_3	CH_3
A-1	SO_2CF_3	Cl	CH_3	A-2	SO_2CF_3	Cl	CH_3
A-1	SO_2CF_3	Cl	Cl	A-2	SO_2CF_3	Cl	Cl
A-1	$SO_2OCH_2CF_3$	CH_3	CH_3	A-2	$SO_2OCH_2CF_3$	CH_3	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	CH_3	A-2	$SO_2OCH_2CF_3$	Cl	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	Cl	A-2	$SO_2OCH_2CF_3$	Cl	Cl
A-1	CF_3	CH_3	CH_3	A-2	CF_3	CH_3	CH_3
A-1	CF_3	Cl	CH_3	A-2	CF_3	Cl	CH_3
A-1	CF_3	Cl	Cl	A-2	CF_3	Cl	Cl
A-1	OCH_3	CH_3	CH_3	A-2	OCH_3	CH_3	CH_3
A-1	OCH_3	Cl	CH_3	A-2	OCH_3	Cl	CH_3
A-1	OCH_3	Cl	Cl	A-2	OCH_3	Cl	Cl
A-1	NO_2	CH_3	CH_3	A-2	NO_2	CH_3	CH_3
A-1	NO_2	Cl	CH_3	A-2	NO_2	Cl	CH_3
A-1	NO_2	Cl	Cl	A-2	NO_2	Cl	Cl
A-5	SO_2CH_3	NO_2	CH_3	A-7	SO_2CH_3	NO_2	CH_3
A-5	SO_2CH_3	Cl	CH_3	A-7	SO_2CH_3	Cl	CH_3
A-5	SO_2CH_3	Cl	Cl	A-7	SO_2CH_3	Cl	Cl
A-5	$SO_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_3$	Cl	Cl
A-5	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-5	$SO_2N(CH_3)_2$	CH_3	CH_3	A-7	$SO_2N(CH_3)_2$	CH_3	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	CH_3	A-7	$SO_2N(CH_3)_2$	Cl	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	Cl	A-7	$SO_2N(CH_3)_2$	Cl	Cl
A-5	SO_2CF_3	CH_3	CH_3	A-7	SO_2CF_3	CH_3	CH_3
A-5	SO_2CF_3	Cl	CH_3	A-7	SO_2CF_3	Cl	CH_3
A-5	SO_2CF_3	Cl	Cl	A-7	SO_2CF_3	Cl	Cl
A-5	$SO_2OCH_2CF_3$	CH_3	CH_3	A-7	$SO_2OCH_2CF_3$	CH_3	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	CH_3	A-7	$SO_2OCH_2CF_3$	Cl	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	Cl	A-7	$SO_2OCH_2CF_3$	Cl	Cl
A-5	CF_3	CH_3	CH_3	A-7	CF_3	CH_3	CH_3
A-5	CF_3	Cl	CH_3	A-7	CF_3	Cl	CH_3

A-5	CF_3	Cl	Cl	A-7	CF_3	Cl	Cl
A-5	OCH_3	CH_3	CH_3	A-7	OCH_3	CH_3	CH_3
A-5	OCH_3	Cl	CH_3	A-7	OCH_3	Cl	CH_3
A-5	OCH_3	Cl	Cl	A-7	OCH_3	Cl	Cl
A-5	NO_2	CH_3	CH_3	A-7	NO_2	CH_3	CH_3
A-5	NO_2	Cl	CH_3	A-7	NO_2	Cl	CH_3
A-5	NO_2	Cl	Cl	A-7	NO_2	Cl	Cl
A-8	SO_2CH_3	NO_2	CH_3	A-9	SO_2CH_3	NO_2	CH_3
A-8	SO_2CH_3	Cl	CH_3	A-9	SO_2CH_3	Cl	CH_3
A-8	SO_2CH_3	Cl	Cl	A-9	SO_2CH_3	Cl	Cl
A-8	$SO_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_3$	Cl	Cl
A-8	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-8	$SO_2N(CH_3)_2$	CH_3	CH_3	A-9	$SO_2N(CH_3)_2$	CH_3	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	CH_3	A-9	$SO_2N(CH_3)_2$	Cl	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	Cl	A-9	$SO_2N(CH_3)_2$	Cl	Cl
A-8	SO_2CF_3	CH_3	CH_3	A-9	SO_2CF_3	CH_3	CH_3
A-8	SO_2CF_3	Cl	CH_3	A-9	SO_2CF_3	Cl	CH_3
A-8	SO_2CF_3	Cl	Cl	A-9	SO_2CF_3	Cl	Cl
A-8	$SO_2OCH_2CF_3$	CH_3	CH_3	A-9	$SO_2OCH_2CF_3$	CH_3	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	CH_3	A-9	$SO_2OCH_2CF_3$	Cl	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	Cl	A-9	$SO_2OCH_2CF_3$	Cl	Cl
A-8	CF_3	CH_3	CH_3	A-9	CF_3	CH_3	CH_3
A-8	CF_3	Cl	CH_3	A-9	CF_3	Cl	CH_3
A-8	CF_3	Cl	Cl	A-9	CF_3	Cl	Cl
A-8	OCH_3	CH_3	CH_3	A-9	OCH_3	CH_3	CH_3
A-8	OCH_3	Cl	CH_3	A-9	OCH_3	Cl	CH_3
A-8	OCH_3	Cl	Cl	A-9	OCH_3	Cl	Cl
A-8	NO_2	CH_3	CH_3	A-9	NO_2	CH_3	CH_3
A-8	NO_2	Cl	CH_3	A-9	NO_2	Cl	CH_3
A-8	NO_2	Cl	Cl	A-9	NO_2	Cl	Cl
A-24	SO_2CH_3	NO_2	CH_3	A-33	SO_2CH_3	NO_2	CH_3
A-24	SO_2CH_3	Cl	CH_3	A-33	SO_2CH_3	Cl	CH_3
A-24	SO_2CH_3	Cl	Cl	A-33	SO_2CH_3	Cl	Cl
A-24	$SO_2CH_2CH_3$	Cl	CH_3	A-33	$SO_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_3$	Cl	Cl	A-33	$SO_2CH_2CH_3$	Cl	Cl
A-24	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-33	$SO_2CH_2CH_2CH_3$	Cl	CH_3

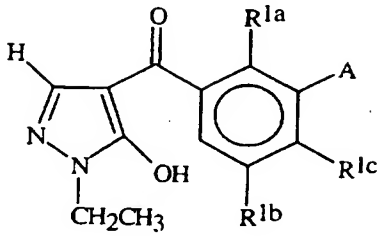
A-24	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-24	$SO_2N(CH_3)_2$	CH_3	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	Cl
A-24	SO_2CF_3	CH_3	CH_3
A-24	SO_2CF_3	Cl	CH_3
A-24	SO_2CF_3	Cl	Cl
A-24	$SO_2OCH_2CF_3$	CH_3	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	Cl
A-24	CF_3	CH_3	CH_3
A-24	CF_3	Cl	CH_3
A-24	CF_3	Cl	Cl
A-24	OCH_3	CH_3	CH_3
A-24	OCH_3	Cl	CH_3
A-24	OCH_3	Cl	Cl
A-24	NO_2	CH_3	CH_3
A-24	NO_2	Cl	CH_3
A-24	NO_2	Cl	Cl
A-42	SO_2CH_3	NO_2	CH_3
A-42	SO_2CH_3	Cl	CH_3
A-42	SO_2CH_3	Cl	Cl
A-42	$SO_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_3$	Cl	Cl
A-42	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-42	$SO_2N(CH_3)_2$	CH_3	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	Cl
A-42	SO_2CF_3	CH_3	CH_3
A-42	SO_2CF_3	Cl	CH_3
A-42	SO_2CF_3	Cl	Cl
A-42	$SO_2OCH_2CF_3$	CH_3	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	Cl
A-42	CF_3	CH_3	CH_3
A-42	CF_3	Cl	CH_3
A-42	CF_3	Cl	Cl
A-33	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-33	$SO_2N(CH_3)_2$	CH_3	CH_3
A-33	$SO_2N(CH_3)_2$	Cl	CH_3
A-33	$SO_2N(CH_3)_2$	Cl	Cl
A-33	SO_2CF_3	CH_3	CH_3
A-33	SO_2CF_3	Cl	CH_3
A-33	SO_2CF_3	Cl	Cl
A-33	$SO_2OCH_2CF_3$	CH_3	CH_3
A-33	$SO_2OCH_2CF_3$	Cl	CH_3
A-33	$SO_2OCH_2CF_3$	Cl	Cl
A-33	CF_3	CH_3	CH_3
A-33	CF_3	Cl	CH_3
A-33	CF_3	Cl	Cl
A-33	OCH_3	CH_3	CH_3
A-33	OCH_3	Cl	CH_3
A-33	OCH_3	Cl	Cl
A-33	NO_2	CH_3	CH_3
A-33	NO_2	Cl	CH_3
A-33	NO_2	Cl	Cl
A-44	SO_2CH_3	NO_2	CH_3
A-44	SO_2CH_3	Cl	CH_3
A-44	SO_2CH_3	Cl	Cl
A-44	$SO_2CH_2CH_3$	Cl	CH_3
A-44	$SO_2CH_2CH_3$	Cl	Cl
A-44	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-44	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-44	$SO_2N(CH_3)_2$	CH_3	CH_3
A-44	$SO_2N(CH_3)_2$	Cl	CH_3
A-44	$SO_2N(CH_3)_2$	Cl	Cl
A-44	SO_2CF_3	CH_3	CH_3
A-44	SO_2CF_3	Cl	CH_3
A-44	SO_2CF_3	Cl	Cl
A-44	$SO_2OCH_2CF_3$	CH_3	CH_3
A-44	$SO_2OCH_2CF_3$	Cl	CH_3
A-44	$SO_2OCH_2CF_3$	Cl	Cl
A-44	CF_3	CH_3	CH_3
A-44	CF_3	Cl	CH_3
A-44	CF_3	Cl	Cl

A-42	OCH_3	CH_3	CH_3
A-42	OCH_3	Cl	CH_3
A-42	OCH_3	Cl	Cl
A-42	NO_2	CH_3	CH_3
A-42	NO_2	Cl	CH_3
A-42	NO_2	Cl	Cl
A-45	SO_2CH_3	NO_2	CH_3
A-45	SO_2CH_3	Cl	CH_3
A-45	SO_2CH_3	Cl	Cl
A-45	$SO_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_3$	Cl	Cl
A-45	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-45	$SO_2N(CH_3)_2$	CH_3	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	Cl
A-45	SO_2CF_3	CH_3	CH_3
A-45	SO_2CF_3	Cl	CH_3
A-45	SO_2CF_3	Cl	Cl
A-45	$SO_2OCH_2CF_3$	CH_3	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	Cl
A-45	CF_3	CH_3	CH_3
A-45	CF_3	Cl	CH_3
A-45	CF_3	Cl	Cl
A-45	OCH_3	CH_3	CH_3
A-45	OCH_3	Cl	CH_3
A-45	OCH_3	Cl	Cl
A-45	NO_2	CH_3	CH_3
A-45	NO_2	Cl	CH_3
A-45	NO_2	Cl	Cl
A-68	SO_2CH_3	NO_2	CH_3
A-68	SO_2CH_3	Cl	CH_3
A-68	SO_2CH_3	Cl	Cl
A-68	$SO_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_3$	Cl	Cl
A-68	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-44	OCH_3	CH_3	CH_3
A-44	OCH_3	Cl	CH_3
A-44	OCH_3	Cl	Cl
A-44	NO_2	CH_3	CH_3
A-44	NO_2	Cl	CH_3
A-44	NO_2	Cl	Cl
A-67	SO_2CH_3	NO_2	CH_3
A-67	SO_2CH_3	Cl	CH_3
A-67	SO_2CH_3	Cl	Cl
A-67	$SO_2CH_2CH_3$	Cl	CH_3
A-67	$SO_2CH_2CH_3$	Cl	Cl
A-67	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-67	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-67	$SO_2N(CH_3)_2$	CH_3	CH_3
A-67	$SO_2N(CH_3)_2$	Cl	CH_3
A-67	$SO_2N(CH_3)_2$	Cl	Cl
A-67	SO_2CF_3	CH_3	CH_3
A-67	SO_2CF_3	Cl	CH_3
A-67	SO_2CF_3	Cl	Cl
A-67	$SO_2OCH_2CF_3$	CH_3	CH_3
A-67	$SO_2OCH_2CF_3$	Cl	CH_3
A-67	$SO_2OCH_2CF_3$	Cl	Cl
A-67	CF_3	CH_3	CH_3
A-67	CF_3	Cl	CH_3
A-67	CF_3	Cl	Cl
A-67	OCH_3	CH_3	CH_3
A-67	OCH_3	Cl	CH_3
A-67	OCH_3	Cl	Cl
A-67	NO_2	CH_3	CH_3
A-67	NO_2	Cl	CH_3
A-67	NO_2	Cl	Cl
A-71	SO_2CH_3	NO_2	CH_3
A-71	SO_2CH_3	Cl	CH_3
A-71	SO_2CH_3	Cl	Cl
A-71	$SO_2CH_2CH_3$	Cl	CH_3
A-71	$SO_2CH_2CH_3$	Cl	Cl
A-71	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-71	$SO_2CH_2CH_2CH_3$	Cl	Cl

A-68	$SO_2N(CH_3)_2$	CH_3	CH_3	A-71	$SO_2N(CH_3)_2$	CH_3	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	CH_3	A-71	$SO_2N(CH_3)_2$	Cl	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	Cl	A-71	$SO_2N(CH_3)_2$	Cl	Cl
A-68	SO_2CF_3	CH_3	CH_3	A-71	SO_2CF_3	CH_3	CH_3
A-68	SO_2CF_3	Cl	CH_3	A-71	SO_2CF_3	Cl	CH_3
A-68	SO_2CF_3	Cl	Cl	A-71	SO_2CF_3	Cl	Cl
A-68	$SO_2OCH_2CF_3$	CH_3	CH_3	A-71	$SO_2OCH_2CF_3$	CH_3	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	CH_3	A-71	$SO_2OCH_2CF_3$	Cl	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	Cl	A-71	$SO_2OCH_2CF_3$	Cl	Cl
A-68	CF_3	CH_3	CH_3	A-71	CF_3	CH_3	CH_3
A-68	CF_3	Cl	CH_3	A-71	CF_3	Cl	CH_3
A-68	CF_3	Cl	Cl	A-71	CF_3	Cl	Cl
A-68	OCH_3	CH_3	CH_3	A-71	OCH_3	CH_3	CH_3
A-68	OCH_3	Cl	CH_3	A-71	OCH_3	Cl	CH_3
A-68	OCH_3	Cl	Cl	A-71	OCH_3	Cl	Cl
A-68	NO_2	CH_3	CH_3	A-71	NO_2	CH_3	CH_3
A-68	NO_2	Cl	CH_3	A-71	NO_2	Cl	CH_3
A-68	NO_2	Cl	Cl	A-71	NO_2	Cl	Cl
A-78	SO_2CH_3	NO_2	CH_3	A-91	SO_2CH_3	NO_2	CH_3
A-78	SO_2CH_3	Cl	CH_3	A-91	SO_2CH_3	Cl	CH_3
A-78	SO_2CH_3	Cl	Cl	A-91	SO_2CH_3	Cl	Cl
A-78	$SO_2CH_2CH_3$	Cl	CH_3	A-91	$SO_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_3$	Cl	Cl	A-91	$SO_2CH_2CH_3$	Cl	Cl
A-78	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-91	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-91	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-78	$SO_2N(CH_3)_2$	CH_3	CH_3	A-91	$SO_2N(CH_3)_2$	CH_3	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	CH_3	A-91	$SO_2N(CH_3)_2$	Cl	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	Cl	A-91	$SO_2N(CH_3)_2$	Cl	Cl
A-78	SO_2CF_3	CH_3	CH_3	A-91	SO_2CF_3	CH_3	CH_3
A-78	SO_2CF_3	Cl	CH_3	A-91	SO_2CF_3	Cl	CH_3
A-78	SO_2CF_3	Cl	Cl	A-91	SO_2CF_3	Cl	Cl
A-78	$SO_2OCH_2CF_3$	CH_3	CH_3	A-91	$SO_2OCH_2CF_3$	CH_3	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	CH_3	A-91	$SO_2OCH_2CF_3$	Cl	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	Cl	A-91	$SO_2OCH_2CF_3$	Cl	Cl
A-78	CF_3	CH_3	CH_3	A-91	CF_3	CH_3	CH_3
A-78	CF_3	Cl	CH_3	A-91	CF_3	Cl	CH_3
A-78	CF_3	Cl	Cl	A-91	CF_3	Cl	Cl
A-78	OCH_3	CH_3	CH_3	A-91	OCH_3	CH_3	CH_3

A-78	OCH_3	Cl	CH_3	A-91	OCH_3	Cl	CH_3
A-78	OCH_3	Cl	Cl	A-91	OCH_3	Cl	Cl
A-78	NO_2	CH_3	CH_3	A-91	NO_2	CH_3	CH_3
A-78	NO_2	Cl	CH_3	A-91	NO_2	Cl	CH_3
A-78	NO_2	Cl	Cl	A-91	NO_2	Cl	Cl

TABLE 8



A	R^{1c}	R^{1a}	R^{1b}	A	R^{1c}	R^{1a}	R^{1b}
A-1	SO_2CH_3	NO_2	CH_3	A-2	SO_2CH_3	NO_2	CH_3
A-1	SO_2CH_3	Cl	CH_3	A-2	SO_2CH_3	Cl	CH_3
A-1	SO_2CH_3	Cl	Cl	A-2	SO_2CH_3	Cl	Cl
A-1	$SO_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_3$	Cl	Cl
A-1	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-1	$SO_2N(CH_3)_2$	CH_3	CH_3	A-2	$SO_2N(CH_3)_2$	CH_3	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	CH_3	A-2	$SO_2N(CH_3)_2$	Cl	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	Cl	A-2	$SO_2N(CH_3)_2$	Cl	Cl
A-1	SO_2CF_3	CH_3	CH_3	A-2	SO_2CF_3	CH_3	CH_3
A-1	SO_2CF_3	Cl	CH_3	A-2	SO_2CF_3	Cl	CH_3
A-1	SO_2CF_3	Cl	Cl	A-2	SO_2CF_3	Cl	Cl
A-1	$SO_2OCH_2CF_3$	CH_3	CH_3	A-2	$SO_2OCH_2CF_3$	CH_3	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	CH_3	A-2	$SO_2OCH_2CF_3$	Cl	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	Cl	A-2	$SO_2OCH_2CF_3$	Cl	Cl
A-1	CF_3	CH_3	CH_3	A-2	CF_3	CH_3	CH_3
A-1	CF_3	Cl	CH_3	A-2	CF_3	Cl	CH_3
A-1	CF_3	Cl	Cl	A-2	CF_3	Cl	Cl
A-1	OCH_3	CH_3	CH_3	A-2	OCH_3	CH_3	CH_3
A-1	OCH_3	Cl	CH_3	A-2	OCH_3	Cl	CH_3
A-1	OCH_3	Cl	Cl	A-2	OCH_3	Cl	Cl

A-1	NO_2	CH_3	CH_3	A-2	NO_2	CH_3	CH_3
A-1	NO_2	Cl	CH_3	A-2	NO_2	Cl	CH_3
A-1	NO_2	Cl	Cl	A-2	NO_2	Cl	Cl
A-5	SO_2CH_3	NO_2	CH_3	A-7	SO_2CH_3	NO_2	CH_3
A-5	SO_2CH_3	Cl	CH_3	A-7	SO_2CH_3	Cl	CH_3
A-5	SO_2CH_3	Cl	Cl	A-7	SO_2CH_3	Cl	Cl
A-5	$SO_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_3$	Cl	Cl
A-5	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-5	$SO_2N(CH_3)_2$	CH_3	CH_3	A-7	$SO_2N(CH_3)_2$	CH_3	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	CH_3	A-7	$SO_2N(CH_3)_2$	Cl	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	Cl	A-7	$SO_2N(CH_3)_2$	Cl	Cl
A-5	SO_2CF_3	CH_3	CH_3	A-7	SO_2CF_3	CH_3	CH_3
A-5	SO_2CF_3	Cl	CH_3	A-7	SO_2CF_3	Cl	CH_3
A-5	SO_2CF_3	Cl	Cl	A-7	SO_2CF_3	Cl	Cl
A-5	$SO_2OCH_2CF_3$	CH_3	CH_3	A-7	$SO_2OCH_2CF_3$	CH_3	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	CH_3	A-7	$SO_2OCH_2CF_3$	Cl	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	Cl	A-7	$SO_2OCH_2CF_3$	Cl	Cl
A-5	CF_3	CH_3	CH_3	A-7	CF_3	CH_3	CH_3
A-5	CF_3	Cl	CH_3	A-7	CF_3	Cl	CH_3
A-5	CF_3	Cl	Cl	A-7	CF_3	Cl	Cl
A-5	OCH_3	CH_3	CH_3	A-7	OCH_3	CH_3	CH_3
A-5	OCH_3	Cl	CH_3	A-7	OCH_3	Cl	CH_3
A-5	OCH_3	Cl	Cl	A-7	OCH_3	Cl	Cl
A-5	NO_2	CH_3	CH_3	A-7	NO_2	CH_3	CH_3
A-5	NO_2	Cl	CH_3	A-7	NO_2	Cl	CH_3
A-5	NO_2	Cl	Cl	A-7	NO_2	Cl	Cl
A-8	SO_2CH_3	NO_2	CH_3	A-9	SO_2CH_3	NO_2	CH_3
A-8	SO_2CH_3	Cl	CH_3	A-9	SO_2CH_3	Cl	CH_3
A-8	SO_2CH_3	Cl	Cl	A-9	SO_2CH_3	Cl	Cl
A-8	$SO_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_3$	Cl	Cl
A-8	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-8	$SO_2N(CH_3)_2$	CH_3	CH_3	A-9	$SO_2N(CH_3)_2$	CH_3	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	CH_3	A-9	$SO_2N(CH_3)_2$	Cl	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	Cl	A-9	$SO_2N(CH_3)_2$	Cl	Cl

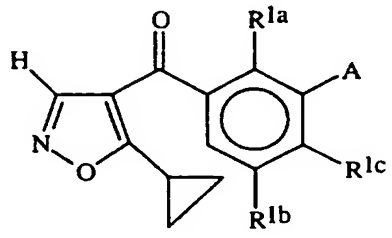
A-8	SO_2CF_3	CH_3	CH_3	A-9	SO_2CF_3	CH_3	CH_3
A-8	SO_2CF_3	Cl	CH_3	A-9	SO_2CF_3	Cl	CH_3
A-8	SO_2CF_3	Cl	Cl	A-9	SO_2CF_3	Cl	Cl
A-8	$SO_2OCH_2CF_3$	CH_3	CH_3	A-9	$SO_2OCH_2CF_3$	CH_3	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	CH_3	A-9	$SO_2OCH_2CF_3$	Cl	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	Cl	A-9	$SO_2OCH_2CF_3$	Cl	Cl
A-8	CF_3	CH_3	CH_3	A-9	CF_3	CH_3	CH_3
A-8	CF_3	Cl	CH_3	A-9	CF_3	Cl	CH_3
A-8	CF_3	Cl	Cl	A-9	CF_3	Cl	Cl
A-8	OCH_3	CH_3	CH_3	A-9	OCH_3	CH_3	CH_3
A-8	OCH_3	Cl	CH_3	A-9	OCH_3	Cl	CH_3
A-8	OCH_3	Cl	Cl	A-9	OCH_3	Cl	Cl
A-8	NO_2	CH_3	CH_3	A-9	NO_2	CH_3	CH_3
A-8	NO_2	Cl	CH_3	A-9	NO_2	Cl	CH_3
A-8	NO_2	Cl	Cl	A-9	NO_2	Cl	Cl
A-24	SO_2CH_3	NO_2	CH_3	A-33	SO_2CH_3	NO_2	CH_3
A-24	SO_2CH_3	Cl	CH_3	A-33	SO_2CH_3	Cl	CH_3
A-24	SO_2CH_3	Cl	Cl	A-33	SO_2CH_3	Cl	Cl
A-24	$SO_2CH_2CH_3$	Cl	CH_3	A-33	$SO_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_3$	Cl	Cl	A-33	$SO_2CH_2CH_3$	Cl	Cl
A-24	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-33	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-33	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-24	$SO_2N(CH_3)_2$	CH_3	CH_3	A-33	$SO_2N(CH_3)_2$	CH_3	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	CH_3	A-33	$SO_2N(CH_3)_2$	Cl	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	Cl	A-33	$SO_2N(CH_3)_2$	Cl	Cl
A-24	SO_2CF_3	CH_3	CH_3	A-33	SO_2CF_3	CH_3	CH_3
A-24	SO_2CF_3	Cl	CH_3	A-33	SO_2CF_3	Cl	CH_3
A-24	SO_2CF_3	Cl	Cl	A-33	SO_2CF_3	Cl	Cl
A-24	$SO_2OCH_2CF_3$	CH_3	CH_3	A-33	$SO_2OCH_2CF_3$	CH_3	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	CH_3	A-33	$SO_2OCH_2CF_3$	Cl	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	Cl	A-33	$SO_2OCH_2CF_3$	Cl	Cl
A-24	CF_3	CH_3	CH_3	A-33	CF_3	CH_3	CH_3
A-24	CF_3	Cl	CH_3	A-33	CF_3	Cl	CH_3
A-24	CF_3	Cl	Cl	A-33	CF_3	Cl	Cl
A-24	OCH_3	CH_3	CH_3	A-33	OCH_3	CH_3	CH_3
A-24	OCH_3	Cl	CH_3	A-33	OCH_3	Cl	CH_3
A-24	OCH_3	Cl	Cl	A-33	OCH_3	Cl	Cl
A-24	NO_2	CH_3	CH_3	A-33	NO_2	CH_3	CH_3

A-24	NO_2	Cl	CH_3	A-33	NO_2	Cl	CH_3
A-24	NO_2	Cl	Cl	A-33	NO_2	Cl	Cl
A-42	SO_2CH_3	NO_2	CH_3	A-44	SO_2CH_3	NO_2	CH_3
A-42	SO_2CH_3	Cl	CH_3	A-44	SO_2CH_3	Cl	CH_3
A-42	SO_2CH_3	Cl	Cl	A-44	SO_2CH_3	Cl	Cl
A-42	$SO_2CH_2CH_3$	Cl	CH_3	A-44	$SO_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_3$	Cl	Cl	A-44	$SO_2CH_2CH_3$	Cl	Cl
A-42	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-44	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-44	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-42	$SO_2N(CH_3)_2$	CH_3	CH_3	A-44	$SO_2N(CH_3)_2$	CH_3	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	CH_3	A-44	$SO_2N(CH_3)_2$	Cl	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	Cl	A-44	$SO_2N(CH_3)_2$	Cl	Cl
A-42	SO_2CF_3	CH_3	CH_3	A-44	SO_2CF_3	CH_3	CH_3
A-42	SO_2CF_3	Cl	CH_3	A-44	SO_2CF_3	Cl	CH_3
A-42	SO_2CF_3	Cl	Cl	A-44	SO_2CF_3	Cl	Cl
A-42	$SO_2OCH_2CF_3$	CH_3	CH_3	A-44	$SO_2OCH_2CF_3$	CH_3	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	CH_3	A-44	$SO_2OCH_2CF_3$	Cl	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	Cl	A-44	$SO_2OCH_2CF_3$	Cl	Cl
A-42	CF_3	CH_3	CH_3	A-44	CF_3	CH_3	CH_3
A-42	CF_3	Cl	CH_3	A-44	CF_3	Cl	CH_3
A-42	CF_3	Cl	Cl	A-44	CF_3	Cl	Cl
A-42	OCH_3	CH_3	CH_3	A-44	OCH_3	CH_3	CH_3
A-42	OCH_3	Cl	CH_3	A-44	OCH_3	Cl	CH_3
A-42	OCH_3	Cl	Cl	A-44	OCH_3	Cl	Cl
A-42	NO_2	CH_3	CH_3	A-44	NO_2	CH_3	CH_3
A-42	NO_2	Cl	CH_3	A-44	NO_2	Cl	CH_3
A-42	NO_2	Cl	Cl	A-44	NO_2	Cl	Cl
A-45	SO_2CH_3	NO_2	CH_3	A-67	SO_2CH_3	NO_2	CH_3
A-45	SO_2CH_3	Cl	CH_3	A-67	SO_2CH_3	Cl	CH_3
A-45	SO_2CH_3	Cl	Cl	A-67	SO_2CH_3	Cl	Cl
A-45	$SO_2CH_2CH_3$	Cl	CH_3	A-67	$SO_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_3$	Cl	Cl	A-67	$SO_2CH_2CH_3$	Cl	Cl
A-45	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-67	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-67	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-45	$SO_2N(CH_3)_2$	CH_3	CH_3	A-67	$SO_2N(CH_3)_2$	CH_3	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	CH_3	A-67	$SO_2N(CH_3)_2$	Cl	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	Cl	A-67	$SO_2N(CH_3)_2$	Cl	Cl
A-45	SO_2CF_3	CH_3	CH_3	A-67	SO_2CF_3	CH_3	CH_3

A-45	SO_2CF_3	Cl	CH_3
A-45	SO_2CF_3	Cl	Cl
A-45	$SO_2OCH_2CF_3$	CH_3	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	Cl
A-45	CF_3	CH_3	CH_3
A-45	CF_3	Cl	CH_3
A-45	CF_3	Cl	Cl
A-45	OCH_3	CH_3	CH_3
A-45	OCH_3	Cl	CH_3
A-45	OCH_3	Cl	Cl
A-45	NO_2	CH_3	CH_3
A-45	NO_2	Cl	CH_3
A-45	NO_2	Cl	Cl
A-68	SO_2CH_3	NO_2	CH_3
A-68	SO_2CH_3	Cl	CH_3
A-68	SO_2CH_3	Cl	Cl
A-68	$SO_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_3$	Cl	Cl
A-68	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-68	$SO_2N(CH_3)_2$	CH_3	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	Cl
A-68	SO_2CF_3	CH_3	CH_3
A-68	SO_2CF_3	Cl	CH_3
A-68	SO_2CF_3	Cl	Cl
A-68	$SO_2OCH_2CF_3$	CH_3	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	Cl
A-68	CF_3	CH_3	CH_3
A-68	CF_3	Cl	CH_3
A-68	CF_3	Cl	Cl
A-68	OCH_3	CH_3	CH_3
A-68	OCH_3	Cl	CH_3
A-68	OCH_3	Cl	Cl
A-68	NO_2	CH_3	CH_3
A-68	NO_2	Cl	CH_3
A-67	SO_2CF_3	Cl	CH_3
A-67	SO_2CF_3	Cl	Cl
A-67	$SO_2OCH_2CF_3$	CH_3	CH_3
A-67	$SO_2OCH_2CF_3$	Cl	CH_3
A-67	$SO_2OCH_2CF_3$	Cl	Cl
A-67	CF_3	CH_3	CH_3
A-67	CF_3	Cl	CH_3
A-67	CF_3	Cl	Cl
A-67	OCH_3	CH_3	CH_3
A-67	OCH_3	Cl	CH_3
A-67	OCH_3	Cl	Cl
A-67	NO_2	CH_3	CH_3
A-67	NO_2	Cl	CH_3
A-67	NO_2	Cl	Cl
A-71	SO_2CH_3	NO_2	CH_3
A-71	SO_2CH_3	Cl	CH_3
A-71	SO_2CH_3	Cl	Cl
A-71	$SO_2CH_2CH_3$	Cl	CH_3
A-71	$SO_2CH_2CH_3$	Cl	Cl
A-71	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-71	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-71	$SO_2N(CH_3)_2$	CH_3	CH_3
A-71	$SO_2N(CH_3)_2$	Cl	CH_3
A-71	$SO_2N(CH_3)_2$	Cl	Cl
A-71	SO_2CF_3	CH_3	CH_3
A-71	SO_2CF_3	Cl	CH_3
A-71	SO_2CF_3	Cl	Cl
A-71	$SO_2OCH_2CF_3$	CH_3	CH_3
A-71	$SO_2OCH_2CF_3$	Cl	CH_3
A-71	$SO_2OCH_2CF_3$	Cl	Cl
A-71	CF_3	CH_3	CH_3
A-71	CF_3	Cl	CH_3
A-71	CF_3	Cl	Cl
A-71	OCH_3	CH_3	CH_3
A-71	OCH_3	Cl	CH_3
A-71	OCH_3	Cl	Cl
A-71	NO_2	CH_3	CH_3
A-71	NO_2	Cl	CH_3

A-68	NO_2	Cl	Cl	A-71	NO_2	Cl	Cl
A-78	SO_2CH_3	NO_2	CH_3	A-91	SO_2CH_3	NO_2	CH_3
A-78	SO_2CH_3	Cl	CH_3	A-91	SO_2CH_3	Cl	CH_3
A-78	SO_2CH_3	Cl	Cl	A-91	SO_2CH_3	Cl	Cl
A-78	$SO_2CH_2CH_3$	Cl	CH_3	A-91	$SO_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_3$	Cl	Cl	A-91	$SO_2CH_2CH_3$	Cl	Cl
A-78	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-91	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-91	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-78	$SO_2N(CH_3)_2$	CH_3	CH_3	A-91	$SO_2N(CH_3)_2$	CH_3	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	CH_3	A-91	$SO_2N(CH_3)_2$	Cl	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	Cl	A-91	$SO_2N(CH_3)_2$	Cl	Cl
A-78	SO_2CF_3	CH_3	CH_3	A-91	SO_2CF_3	CH_3	CH_3
A-78	SO_2CF_3	Cl	CH_3	A-91	SO_2CF_3	Cl	CH_3
A-78	SO_2CF_3	Cl	Cl	A-91	SO_2CF_3	Cl	Cl
A-78	$SO_2OCH_2CF_3$	CH_3	CH_3	A-91	$SO_2OCH_2CF_3$	CH_3	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	CH_3	A-91	$SO_2OCH_2CF_3$	Cl	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	Cl	A-91	$SO_2OCH_2CF_3$	Cl	Cl
A-78	CF_3	CH_3	CH_3	A-91	CF_3	CH_3	CH_3
A-78	CF_3	Cl	CH_3	A-91	CF_3	Cl	CH_3
A-78	CF_3	Cl	Cl	A-91	CF_3	Cl	Cl
A-78	OCH_3	CH_3	CH_3	A-91	OCH_3	CH_3	CH_3
A-78	OCH_3	Cl	CH_3	A-91	OCH_3	Cl	CH_3
A-78	OCH_3	Cl	Cl	A-91	OCH_3	Cl	Cl
A-78	NO_2	CH_3	CH_3	A-91	NO_2	CH_3	CH_3
A-78	NO_2	Cl	CH_3	A-91	NO_2	Cl	CH_3
A-78	NO_2	Cl	Cl	A-91	NO_2	Cl	Cl

TABLE 9



A	R^{1c}	R^{1a}	R^{1b}	A	R^{1c}	R^{1a}	R^{1b}
A-1	SO_2CH_3	NO_2	CH_3	A-2	SO_2CH_3	NO_2	CH_3

A-1	SO_2CH_3	Cl	CH_3	A-2	SO_2CH_3	Cl	CH_3
A-1	SO_2CH_3	Cl	Cl	A-2	SO_2CH_3	Cl	Cl
A-1	$SO_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_3$	Cl	Cl
A-1	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-1	$SO_2N(CH_3)_2$	CH_3	CH_3	A-2	$SO_2N(CH_3)_2$	CH_3	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	CH_3	A-2	$SO_2N(CH_3)_2$	Cl	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	Cl	A-2	$SO_2N(CH_3)_2$	Cl	Cl
A-1	SO_2CF_3	CH_3	CH_3	A-2	SO_2CF_3	CH_3	CH_3
A-1	SO_2CF_3	Cl	CH_3	A-2	SO_2CF_3	Cl	CH_3
A-1	SO_2CF_3	Cl	Cl	A-2	SO_2CF_3	Cl	Cl
A-1	$SO_2OCH_2CF_3$	CH_3	CH_3	A-2	$SO_2OCH_2CF_3$	CH_3	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	CH_3	A-2	$SO_2OCH_2CF_3$	Cl	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	Cl	A-2	$SO_2OCH_2CF_3$	Cl	Cl
A-1	CF_3	CH_3	CH_3	A-2	CF_3	CH_3	CH_3
A-1	CF_3	Cl	CH_3	A-2	CF_3	Cl	CH_3
A-1	CF_3	Cl	Cl	A-2	CF_3	Cl	Cl
A-1	OCH_3	CH_3	CH_3	A-2	OCH_3	CH_3	CH_3
A-1	OCH_3	Cl	CH_3	A-2	OCH_3	Cl	CH_3
A-1	OCH_3	Cl	Cl	A-2	OCH_3	Cl	Cl
A-1	NO_2	CH_3	CH_3	A-2	NO_2	CH_3	CH_3
A-1	NO_2	Cl	CH_3	A-2	NO_2	Cl	CH_3
A-1	NO_2	Cl	Cl	A-2	NO_2	Cl	Cl
A-5	SO_2CH_3	NO_2	CH_3	A-7	SO_2CH_3	NO_2	CH_3
A-5	SO_2CH_3	Cl	CH_3	A-7	SO_2CH_3	Cl	CH_3
A-5	SO_2CH_3	Cl	Cl	A-7	SO_2CH_3	Cl	Cl
A-5	$SO_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_3$	Cl	Cl
A-5	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-5	$SO_2N(CH_3)_2$	CH_3	CH_3	A-7	$SO_2N(CH_3)_2$	CH_3	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	CH_3	A-7	$SO_2N(CH_3)_2$	Cl	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	Cl	A-7	$SO_2N(CH_3)_2$	Cl	Cl
A-5	SO_2CF_3	CH_3	CH_3	A-7	SO_2CF_3	CH_3	CH_3
A-5	SO_2CF_3	Cl	CH_3	A-7	SO_2CF_3	Cl	CH_3
A-5	SO_2CF_3	Cl	Cl	A-7	SO_2CF_3	Cl	Cl
A-5	$SO_2OCH_2CF_3$	CH_3	CH_3	A-7	$SO_2OCH_2CF_3$	CH_3	CH_3

A-5	$SO_2OGH_2CF_3$	Cl	CH_3	A-7	$SO_2OCH_2CF_3$	Cl	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	Cl	A-7	$SO_2OCH_2CF_3$	Cl	Cl
A-5	CF_3	CH_3	CH_3	A-7	CF_3	CH_3	CH_3
A-5	CF_3	Cl	CH_3	A-7	CF_3	Cl	CH_3
A-5	CF_3	Cl	Cl	A-7	CF_3	Cl	Cl
A-5	OCH_3	CH_3	CH_3	A-7	OCH_3	CH_3	CH_3
A-5	OCH_3	Cl	CH_3	A-7	OCH_3	Cl	CH_3
A-5	OCH_3	Cl	Cl	A-7	OCH_3	Cl	Cl
A-5	NO_2	CH_3	CH_3	A-7	NO_2	CH_3	CH_3
A-5	NO_2	Cl	CH_3	A-7	NO_2	Cl	CH_3
A-5	NO_2	Cl	Cl	A-7	NO_2	Cl	Cl
A-8	SO_2CH_3	NO_2	CH_3	A-9	SO_2CH_3	NO_2	CH_3
A-8	SO_2CH_3	Cl	CH_3	A-9	SO_2CH_3	Cl	CH_3
A-8	SO_2CH_3	Cl	Cl	A-9	SO_2CH_3	Cl	Cl
A-8	$SO_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_3$	Cl	Cl
A-8	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-8	$SO_2N(CH_3)_2$	CH_3	CH_3	A-9	$SO_2N(CH_3)_2$	CH_3	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	CH_3	A-9	$SO_2N(CH_3)_2$	Cl	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	Cl	A-9	$SO_2N(CH_3)_2$	Cl	Cl
A-8	SO_2CF_3	CH_3	CH_3	A-9	SO_2CF_3	CH_3	CH_3
A-8	SO_2CF_3	Cl	CH_3	A-9	SO_2CF_3	Cl	CH_3
A-8	SO_2CF_3	Cl	Cl	A-9	SO_2CF_3	Cl	Cl
A-8	$SO_2OCH_2CF_3$	CH_3	CH_3	A-9	$SO_2OCH_2CF_3$	CH_3	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	CH_3	A-9	$SO_2OCH_2CF_3$	Cl	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	Cl	A-9	$SO_2OCH_2CF_3$	Cl	Cl
A-8	CF_3	CH_3	CH_3	A-9	CF_3	CH_3	CH_3
A-8	CF_3	Cl	CH_3	A-9	CF_3	Cl	CH_3
A-8	CF_3	Cl	Cl	A-9	CF_3	Cl	Cl
A-8	OCH_3	CH_3	CH_3	A-9	OCH_3	CH_3	CH_3
A-8	OCH_3	Cl	CH_3	A-9	OCH_3	Cl	CH_3
A-8	OCH_3	Cl	Cl	A-9	OCH_3	Cl	Cl
A-8	NO_2	CH_3	CH_3	A-9	NO_2	CH_3	CH_3
A-8	NO_2	Cl	CH_3	A-9	NO_2	Cl	CH_3
A-8	NO_2	Cl	Cl	A-9	NO_2	Cl	Cl
A-24	SO_2CH_3	NO_2	CH_3	A-33	SO_2CH_3	NO_2	CH_3
A-24	SO_2CH_3	Cl	CH_3	A-33	SO_2CH_3	Cl	CH_3

A-24	SO_2CH_3	Cl	Cl
A-24	$SO_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_3$	Cl	Cl
A-24	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-24	$SO_2N(CH_3)_2$	CH_3	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	Cl
A-24	SO_2CF_3	CH_3	CH_3
A-24	SO_2CF_3	Cl	CH_3
A-24	SO_2CF_3	Cl	Cl
A-24	$SO_2OCH_2CF_3$	CH_3	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	Cl
A-24	CF_3	CH_3	CH_3
A-24	CF_3	Cl	CH_3
A-24	CF_3	Cl	Cl
A-24	OCH_3	CH_3	CH_3
A-24	OCH_3	Cl	CH_3
A-24	OCH_3	Cl	Cl
A-24	NO_2	CH_3	CH_3
A-24	NO_2	Cl	CH_3
A-24	NO_2	Cl	Cl
A-42	SO_2CH_3	NO_2	CH_3
A-42	SO_2CH_3	Cl	CH_3
A-42	SO_2CH_3	Cl	Cl
A-42	$SO_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_3$	Cl	Cl
A-42	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-42	$SO_2N(CH_3)_2$	CH_3	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	Cl
A-42	SO_2CF_3	CH_3	CH_3
A-42	SO_2CF_3	Cl	CH_3
A-42	SO_2CF_3	Cl	Cl
A-42	$SO_2OCH_2CF_3$	CH_3	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	CH_3

A-33	SO_2CH_3	Cl	Cl
A-33	$SO_2CH_2CH_3$	Cl	CH_3
A-33	$SO_2CH_2CH_3$	Cl	Cl
A-33	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-33	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-33	$SO_2N(CH_3)_2$	CH_3	CH_3
A-33	$SO_2N(CH_3)_2$	Cl	CH_3
A-33	$SO_2N(CH_3)_2$	Cl	Cl
A-33	SO_2CF_3	CH_3	CH_3
A-33	SO_2CF_3	Cl	CH_3
A-33	SO_2CF_3	Cl	Cl
A-33	$SO_2OCH_2CF_3$	CH_3	CH_3
A-33	$SO_2OCH_2CF_3$	Cl	CH_3
A-33	$SO_2OCH_2CF_3$	Cl	Cl
A-33	CF_3	CH_3	CH_3
A-33	CF_3	Cl	CH_3
A-33	CF_3	Cl	Cl
A-33	OCH_3	CH_3	CH_3
A-33	OCH_3	Cl	CH_3
A-33	OCH_3	Cl	Cl
A-33	NO_2	CH_3	CH_3
A-33	NO_2	Cl	CH_3
A-33	NO_2	Cl	Cl
A-44	SO_2CH_3	NO_2	CH_3
A-44	SO_2CH_3	Cl	CH_3
A-44	SO_2CH_3	Cl	Cl
A-44	$SO_2CH_2CH_3$	Cl	CH_3
A-44	$SO_2CH_2CH_3$	Cl	Cl
A-44	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-44	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-44	$SO_2N(CH_3)_2$	CH_3	CH_3
A-44	$SO_2N(CH_3)_2$	Cl	CH_3
A-44	$SO_2N(CH_3)_2$	Cl	Cl
A-44	SO_2CF_3	CH_3	CH_3
A-44	SO_2CF_3	Cl	CH_3
A-44	SO_2CF_3	Cl	Cl
A-44	$SO_2OCH_2CF_3$	CH_3	CH_3
A-44	$SO_2OCH_2CF_3$	Cl	CH_3

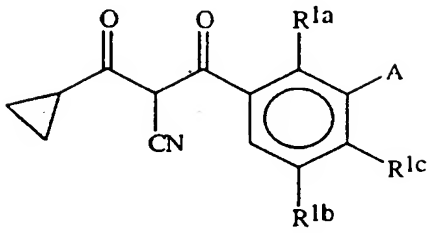
A-42	$SO_2OCH_2CF_3$	Cl	Cl
A-42	CF_3	CH_3	CH_3
A-42	CF_3	Cl	CH_3
A-42	CF_3	Cl	Cl
A-42	OCH_3	CH_3	CH_3
A-42	OCH_3	Cl	CH_3
A-42	OCH_3	Cl	Cl
A-42	NO_2	CH_3	CH_3
A-42	NO_2	Cl	CH_3
A-42	NO_2	Cl	Cl
A-45	SO_2CH_3	NO_2	CH_3
A-45	SO_2CH_3	Cl	CH_3
A-45	SO_2CH_3	Cl	Cl
A-45	$SO_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_3$	Cl	Cl
A-45	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-45	$SO_2N(CH_3)_2$	CH_3	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	Cl
A-45	SO_2CF_3	CH_3	CH_3
A-45	SO_2CF_3	Cl	CH_3
A-45	SO_2CF_3	Cl	Cl
A-45	$SO_2OCH_2CF_3$	CH_3	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	Cl
A-45	CF_3	CH_3	CH_3
A-45	CF_3	Cl	CH_3
A-45	CF_3	Cl	Cl
A-45	OCH_3	CH_3	CH_3
A-45	OCH_3	Cl	CH_3
A-45	OCH_3	Cl	Cl
A-45	NO_2	CH_3	CH_3
A-45	NO_2	Cl	CH_3
A-45	NO_2	Cl	Cl
A-68	SO_2CH_3	NO_2	CH_3
A-68	SO_2CH_3	Cl	CH_3
A-68	SO_2CH_3	Cl	Cl
A-44	$SO_2OCH_2CF_3$	Cl	Cl
A-44	CF_3	CH_3	CH_3
A-44	CF_3	Cl	CH_3
A-44	CF_3	Cl	Cl
A-44	OCH_3	CH_3	CH_3
A-44	OCH_3	Cl	CH_3
A-44	OCH_3	Cl	Cl
A-44	NO_2	CH_3	CH_3
A-44	NO_2	Cl	CH_3
A-44	NO_2	Cl	Cl
A-67	SO_2CH_3	NO_2	CH_3
A-67	SO_2CH_3	Cl	CH_3
A-67	SO_2CH_3	Cl	Cl
A-67	$SO_2CH_2CH_3$	Cl	CH_3
A-67	$SO_2CH_2CH_3$	Cl	Cl
A-67	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-67	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-67	$SO_2N(CH_3)_2$	CH_3	CH_3
A-67	$SO_2N(CH_3)_2$	Cl	CH_3
A-67	$SO_2N(CH_3)_2$	Cl	Cl
A-67	SO_2CF_3	CH_3	CH_3
A-67	SO_2CF_3	Cl	CH_3
A-67	SO_2CF_3	Cl	Cl
A-67	$SO_2OCH_2CF_3$	CH_3	CH_3
A-67	$SO_2OCH_2CF_3$	Cl	CH_3
A-67	$SO_2OCH_2CF_3$	Cl	Cl
A-67	CF_3	CH_3	CH_3
A-67	CF_3	Cl	CH_3
A-67	CF_3	Cl	Cl
A-67	OCH_3	CH_3	CH_3
A-67	OCH_3	Cl	CH_3
A-67	OCH_3	Cl	Cl
A-67	NO_2	CH_3	CH_3
A-67	NO_2	Cl	CH_3
A-67	NO_2	Cl	Cl
A-71	SO_2CH_3	NO_2	CH_3
A-71	SO_2CH_3	Cl	CH_3
A-71	SO_2CH_3	Cl	Cl

A-68	$SO_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_3$	Cl	Cl
A-68	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-68	$SO_2N(CH_3)_2$	CH_3	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	Cl
A-68	SO_2CF_3	CH_3	CH_3
A-68	SO_2CF_3	Cl	CH_3
A-68	SO_2CF_3	Cl	Cl
A-68	$SO_2OCH_2CF_3$	CH_3	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	Cl
A-68	CF_3	CH_3	CH_3
A-68	CF_3	Cl	CH_3
A-68	CF_3	Cl	Cl
A-68	OCH_3	CH_3	CH_3
A-68	OCH_3	Cl	CH_3
A-68	OCH_3	Cl	Cl
A-68	NO_2	CH_3	CH_3
A-68	NO_2	Cl	CH_3
A-68	NO_2	Cl	Cl
A-78	SO_2CH_3	NO_2	CH_3
A-78	SO_2CH_3	Cl	CH_3
A-78	SO_2CH_3	Cl	Cl
A-78	$SO_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_3$	Cl	Cl
A-78	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-78	$SO_2N(CH_3)_2$	CH_3	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	Cl
A-78	SO_2CF_3	CH_3	CH_3
A-78	SO_2CF_3	Cl	CH_3
A-78	SO_2CF_3	Cl	Cl
A-78	$SO_2OCH_2CF_3$	CH_3	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	Cl

A-71	$SO_2CH_2CH_3$	Cl	CH_3
A-71	$SO_2CH_2CH_3$	Cl	Cl
A-71	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-71	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-71	$SO_2N(CH_3)_2$	CH_3	CH_3
A-71	$SO_2N(CH_3)_2$	Cl	CH_3
A-71	$SO_2N(CH_3)_2$	Cl	Cl
A-71	SO_2CF_3	CH_3	CH_3
A-71	SO_2CF_3	Cl	CH_3
A-71	SO_2CF_3	Cl	Cl
A-71	$SO_2OCH_2CF_3$	CH_3	CH_3
A-71	$SO_2OCH_2CF_3$	Cl	CH_3
A-71	$SO_2OCH_2CF_3$	Cl	Cl
A-71	CF_3	CH_3	CH_3
A-71	CF_3	Cl	CH_3
A-71	CF_3	Cl	Cl
A-71	OCH_3	CH_3	CH_3
A-71	OCH_3	Cl	CH_3
A-71	OCH_3	Cl	Cl
A-71	NO_2	CH_3	CH_3
A-71	NO_2	Cl	CH_3
A-71	NO_2	Cl	Cl
A-91	SO_2CH_3	NO_2	CH_3
A-91	SO_2CH_3	Cl	CH_3
A-91	SO_2CH_3	Cl	Cl
A-91	$SO_2CH_2CH_3$	Cl	CH_3
A-91	$SO_2CH_2CH_3$	Cl	Cl
A-91	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-91	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-91	$SO_2N(CH_3)_2$	CH_3	CH_3
A-91	$SO_2N(CH_3)_2$	Cl	CH_3
A-91	$SO_2N(CH_3)_2$	Cl	Cl
A-91	SO_2CF_3	CH_3	CH_3
A-91	SO_2CF_3	Cl	CH_3
A-91	SO_2CF_3	Cl	Cl
A-91	$SO_2OCH_2CF_3$	CH_3	CH_3
A-91	$SO_2OCH_2CF_3$	Cl	CH_3
A-91	$SO_2OCH_2CF_3$	Cl	Cl

A-78	CF_3	CH_3	CH_3	A-91	CF_3	CH_3	CH_3
A-78	CF_3	Cl	CH_3	A-91	CF_3	Cl	CH_3
A-78	CF_3	Cl	Cl	A-91	CF_3	Cl	Cl
A-78	OCH_3	CH_3	CH_3	A-91	OCH_3	CH_3	CH_3
A-78	OCH_3	Cl	CH_3	A-91	OCH_3	Cl	CH_3
A-78	OCH_3	Cl	Cl	A-91	OCH_3	Cl	Cl
A-78	NO_2	CH_3	CH_3	A-91	NO_2	CH_3	CH_3
A-78	NO_2	Cl	CH_3	A-91	NO_2	Cl	CH_3
A-78	NO_2	Cl	Cl	A-91	NO_2	Cl	Cl

TABLE 10



A	R^{1c}	R^{1a}	R^{1b}	A	R^{1c}	R^{1a}	R^{1b}
A-1	SO_2CH_3	NO_2	CH_3	A-2	SO_2CH_3	NO_2	CH_3
A-1	SO_2CH_3	Cl	CH_3	A-2	SO_2CH_3	Cl	CH_3
A-1	SO_2CH_3	Cl	Cl	A-2	SO_2CH_3	Cl	Cl
A-1	$SO_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_3$	Cl	Cl
A-1	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-2	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-1	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-2	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-1	$SO_2N(CH_3)_2$	CH_3	CH_3	A-2	$SO_2N(CH_3)_2$	CH_3	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	CH_3	A-2	$SO_2N(CH_3)_2$	Cl	CH_3
A-1	$SO_2N(CH_3)_2$	Cl	Cl	A-2	$SO_2N(CH_3)_2$	Cl	Cl
A-1	SO_2CF_3	CH_3	CH_3	A-2	SO_2CF_3	CH_3	CH_3
A-1	SO_2CF_3	Cl	CH_3	A-2	SO_2CF_3	Cl	CH_3
A-1	SO_2CF_3	Cl	Cl	A-2	SO_2CF_3	Cl	Cl
A-1	$SO_2OCH_2CF_3$	CH_3	CH_3	A-2	$SO_2OCH_2CF_3$	CH_3	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	CH_3	A-2	$SO_2OCH_2CF_3$	Cl	CH_3
A-1	$SO_2OCH_2CF_3$	Cl	Cl	A-2	$SO_2OCH_2CF_3$	Cl	Cl
A-1	CF_3	CH_3	CH_3	A-2	CF_3	CH_3	CH_3
A-1	CF_3	Cl	CH_3	A-2	CF_3	Cl	CH_3

A-1	CF_3	Cl	Cl	A-2	CF_3	Cl	Cl
A-1	OCH_3	CH_3	CH_3	A-2	OCH_3	CH_3	CH_3
A-1	OCH_3	Cl	CH_3	A-2	OCH_3	Cl	CH_3
A-1	OCH_3	Cl	Cl	A-2	OCH_3	Cl	Cl
A-1	NO_2	CH_3	CH_3	A-2	NO_2	CH_3	CH_3
A-1	NO_2	Cl	CH_3	A-2	NO_2	Cl	CH_3
A-1	NO_2	Cl	Cl	A-2	NO_2	Cl	Cl
A-5	SO_2CH_3	NO_2	CH_3	A-7	SO_2CH_3	NO_2	CH_3
A-5	SO_2CH_3	Cl	CH_3	A-7	SO_2CH_3	Cl	CH_3
A-5	SO_2CH_3	Cl	Cl	A-7	SO_2CH_3	Cl	Cl
A-5	$SO_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_3$	Cl	Cl
A-5	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-7	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-5	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-7	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-5	$SO_2N(CH_3)_2$	CH_3	CH_3	A-7	$SO_2N(CH_3)_2$	CH_3	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	CH_3	A-7	$SO_2N(CH_3)_2$	Cl	CH_3
A-5	$SO_2N(CH_3)_2$	Cl	Cl	A-7	$SO_2N(CH_3)_2$	Cl	Cl
A-5	SO_2CF_3	CH_3	CH_3	A-7	SO_2CF_3	CH_3	CH_3
A-5	SO_2CF_3	Cl	CH_3	A-7	SO_2CF_3	Cl	CH_3
A-5	SO_2CF_3	Cl	Cl	A-7	SO_2CF_3	Cl	Cl
A-5	$SO_2OCH_2CF_3$	CH_3	CH_3	A-7	$SO_2OCH_2CF_3$	CH_3	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	CH_3	A-7	$SO_2OCH_2CF_3$	Cl	CH_3
A-5	$SO_2OCH_2CF_3$	Cl	Cl	A-7	$SO_2OCH_2CF_3$	Cl	Cl
A-5	CF_3	CH_3	CH_3	A-7	CF_3	CH_3	CH_3
A-5	CF_3	Cl	CH_3	A-7	CF_3	Cl	CH_3
A-5	CF_3	Cl	Cl	A-7	CF_3	Cl	Cl
A-5	OCH_3	CH_3	CH_3	A-7	OCH_3	CH_3	CH_3
A-5	OCH_3	Cl	CH_3	A-7	OCH_3	Cl	CH_3
A-5	OCH_3	Cl	Cl	A-7	OCH_3	Cl	Cl
A-5	NO_2	CH_3	CH_3	A-7	NO_2	CH_3	CH_3
A-5	NO_2	Cl	CH_3	A-7	NO_2	Cl	CH_3
A-5	NO_2	Cl	Cl	A-7	NO_2	Cl	Cl
A-8	SO_2CH_3	NO_2	CH_3	A-9	SO_2CH_3	NO_2	CH_3
A-8	SO_2CH_3	Cl	CH_3	A-9	SO_2CH_3	Cl	CH_3
A-8	SO_2CH_3	Cl	Cl	A-9	SO_2CH_3	Cl	Cl
A-8	$SO_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_3$	Cl	CH_3
A-8	$SO_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_3$	Cl	Cl
A-8	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-9	$SO_2CH_2CH_2CH_3$	Cl	CH_3

A-8	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-9	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-8	$SO_2N(CH_3)_2$	CH_3	CH_3	A-9	$SO_2N(CH_3)_2$	CH_3	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	CH_3	A-9	$SO_2N(CH_3)_2$	Cl	CH_3
A-8	$SO_2N(CH_3)_2$	Cl	Cl	A-9	$SO_2N(CH_3)_2$	Cl	Cl
A-8	SO_2CF_3	CH_3	CH_3	A-9	SO_2CF_3	CH_3	CH_3
A-8	SO_2CF_3	Cl	CH_3	A-9	SO_2CF_3	Cl	CH_3
A-8	SO_2CF_3	Cl	Cl	A-9	SO_2CF_3	Cl	Cl
A-8	$SO_2OCH_2CF_3$	CH_3	CH_3	A-9	$SO_2OCH_2CF_3$	CH_3	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	CH_3	A-9	$SO_2OCH_2CF_3$	Cl	CH_3
A-8	$SO_2OCH_2CF_3$	Cl	Cl	A-9	$SO_2OCH_2CF_3$	Cl	Cl
A-8	CF_3	CH_3	CH_3	A-9	CF_3	CH_3	CH_3
A-8	CF_3	Cl	CH_3	A-9	CF_3	Cl	CH_3
A-8	CF_3	Cl	Cl	A-9	CF_3	Cl	Cl
A-8	OCH_3	CH_3	CH_3	A-9	OCH_3	CH_3	CH_3
A-8	OCH_3	Cl	CH_3	A-9	OCH_3	Cl	CH_3
A-8	OCH_3	Cl	Cl	A-9	OCH_3	Cl	Cl
A-8	NO_2	CH_3	CH_3	A-9	NO_2	CH_3	CH_3
A-8	NO_2	Cl	CH_3	A-9	NO_2	Cl	CH_3
A-8	NO_2	Cl	Cl	A-9	NO_2	Cl	Cl
A-24	SO_2CH_3	NO_2	CH_3	A-33	SO_2CH_3	NO_2	CH_3
A-24	SO_2CH_3	Cl	CH_3	A-33	SO_2CH_3	Cl	CH_3
A-24	SO_2CH_3	Cl	Cl	A-33	SO_2CH_3	Cl	Cl
A-24	$SO_2CH_2CH_3$	Cl	CH_3	A-33	$SO_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_3$	Cl	Cl	A-33	$SO_2CH_2CH_3$	Cl	Cl
A-24	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-33	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-24	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-33	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-24	$SO_2N(CH_3)_2$	CH_3	CH_3	A-33	$SO_2N(CH_3)_2$	CH_3	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	CH_3	A-33	$SO_2N(CH_3)_2$	Cl	CH_3
A-24	$SO_2N(CH_3)_2$	Cl	Cl	A-33	$SO_2N(CH_3)_2$	Cl	Cl
A-24	SO_2CF_3	CH_3	CH_3	A-33	SO_2CF_3	CH_3	CH_3
A-24	SO_2CF_3	Cl	CH_3	A-33	SO_2CF_3	Cl	CH_3
A-24	SO_2CF_3	Cl	Cl	A-33	SO_2CF_3	Cl	Cl
A-24	$SO_2OCH_2CF_3$	CH_3	CH_3	A-33	$SO_2OCH_2CF_3$	CH_3	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	CH_3	A-33	$SO_2OCH_2CF_3$	Cl	CH_3
A-24	$SO_2OCH_2CF_3$	Cl	Cl	A-33	$SO_2OCH_2CF_3$	Cl	Cl
A-24	CF_3	CH_3	CH_3	A-33	CF_3	CH_3	CH_3
A-24	CF_3	Cl	CH_3	A-33	CF_3	Cl	CH_3
A-24	CF_3	Cl	Cl	A-33	CF_3	Cl	Cl

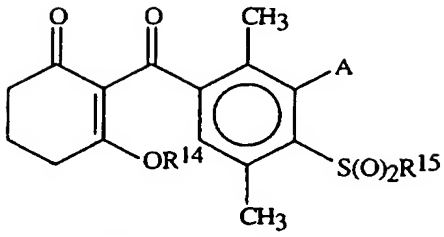
A-24	OCH_3	CH_3	CH_3
A-24	OCH_3	Cl	CH_3
A-24	OCH_3	Cl	Cl
A-24	NO_2	CH_3	CH_3
A-24	NO_2	Cl	CH_3
A-24	NO_2	Cl	Cl
A-42	SO_2CH_3	NO_2	CH_3
A-42	SO_2CH_3	Cl	CH_3
A-42	SO_2CH_3	Cl	Cl
A-42	$SO_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_3$	Cl	Cl
A-42	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-42	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-42	$SO_2N(CH_3)_2$	CH_3	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	CH_3
A-42	$SO_2N(CH_3)_2$	Cl	Cl
A-42	SO_2CF_3	CH_3	CH_3
A-42	SO_2CF_3	Cl	CH_3
A-42	SO_2CF_3	Cl	Cl
A-42	$SO_2OCH_2CF_3$	CH_3	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	CH_3
A-42	$SO_2OCH_2CF_3$	Cl	Cl
A-42	CF_3	CH_3	CH_3
A-42	CF_3	Cl	CH_3
A-42	CF_3	Cl	Cl
A-42	OCH_3	CH_3	CH_3
A-42	OCH_3	Cl	CH_3
A-42	OCH_3	Cl	Cl
A-42	NO_2	CH_3	CH_3
A-42	NO_2	Cl	CH_3
A-42	NO_2	Cl	Cl
A-45	SO_2CH_3	NO_2	CH_3
A-45	SO_2CH_3	Cl	CH_3
A-45	SO_2CH_3	Cl	Cl
A-45	$SO_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_3$	Cl	Cl
A-45	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-45	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-33	OCH_3	CH_3	CH_3
A-33	OCH_3	Cl	CH_3
A-33	OCH_3	Cl	Cl
A-33	NO_2	CH_3	CH_3
A-33	NO_2	Cl	CH_3
A-33	NO_2	Cl	Cl
A-44	SO_2CH_3	NO_2	CH_3
A-44	SO_2CH_3	Cl	CH_3
A-44	SO_2CH_3	Cl	Cl
A-44	$SO_2CH_2CH_3$	Cl	CH_3
A-44	$SO_2CH_2CH_3$	Cl	Cl
A-44	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-44	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-44	$SO_2N(CH_3)_2$	CH_3	CH_3
A-44	$SO_2N(CH_3)_2$	Cl	CH_3
A-44	$SO_2N(CH_3)_2$	Cl	Cl
A-44	SO_2CF_3	CH_3	CH_3
A-44	SO_2CF_3	Cl	CH_3
A-44	SO_2CF_3	Cl	Cl
A-44	$SO_2OCH_2CF_3$	CH_3	CH_3
A-44	$SO_2OCH_2CF_3$	Cl	CH_3
A-44	$SO_2OCH_2CF_3$	Cl	Cl
A-44	CF_3	CH_3	CH_3
A-44	CF_3	Cl	CH_3
A-44	CF_3	Cl	Cl
A-44	OCH_3	CH_3	CH_3
A-44	OCH_3	Cl	CH_3
A-44	OCH_3	Cl	Cl
A-44	NO_2	CH_3	CH_3
A-44	NO_2	Cl	CH_3
A-44	NO_2	Cl	Cl
A-67	SO_2CH_3	NO_2	CH_3
A-67	SO_2CH_3	Cl	CH_3
A-67	SO_2CH_3	Cl	Cl
A-67	$SO_2CH_2CH_3$	Cl	CH_3
A-67	$SO_2CH_2CH_3$	Cl	Cl
A-67	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-67	$SO_2CH_2CH_2CH_3$	Cl	Cl

A-45	$SO_2N(CH_3)_2$	CH_3	CH_3	A-67	$SO_2N(CH_3)_2$	CH_3	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	CH_3	A-67	$SO_2N(CH_3)_2$	Cl	CH_3
A-45	$SO_2N(CH_3)_2$	Cl	Cl	A-67	$SO_2N(CH_3)_2$	Cl	Cl
A-45	SO_2CF_3	CH_3	CH_3	A-67	SO_2CF_3	CH_3	CH_3
A-45	SO_2CF_3	Cl	CH_3	A-67	SO_2CF_3	Cl	CH_3
A-45	SO_2CF_3	Cl	Cl	A-67	SO_2CF_3	Cl	Cl
A-45	$SO_2OCH_2CF_3$	CH_3	CH_3	A-67	$SO_2OCH_2CF_3$	CH_3	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	CH_3	A-67	$SO_2OCH_2CF_3$	Cl	CH_3
A-45	$SO_2OCH_2CF_3$	Cl	Cl	A-67	$SO_2OCH_2CF_3$	Cl	Cl
A-45	CF_3	CH_3	CH_3	A-67	CF_3	CH_3	CH_3
A-45	CF_3	Cl	CH_3	A-67	CF_3	Cl	CH_3
A-45	CF_3	Cl	Cl	A-67	CF_3	Cl	Cl
A-45	OCH_3	CH_3	CH_3	A-67	OCH_3	CH_3	CH_3
A-45	OCH_3	Cl	CH_3	A-67	OCH_3	Cl	CH_3
A-45	OCH_3	Cl	Cl	A-67	OCH_3	Cl	Cl
A-45	NO_2	CH_3	CH_3	A-67	NO_2	CH_3	CH_3
A-45	NO_2	Cl	CH_3	A-67	NO_2	Cl	CH_3
A-45	NO_2	Cl	Cl	A-67	NO_2	Cl	Cl
A-68	SO_2CH_3	NO_2	CH_3	A-71	SO_2CH_3	NO_2	CH_3
A-68	SO_2CH_3	Cl	CH_3	A-71	SO_2CH_3	Cl	CH_3
A-68	SO_2CH_3	Cl	Cl	A-71	SO_2CH_3	Cl	Cl
A-68	$SO_2CH_2CH_3$	Cl	CH_3	A-71	$SO_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_3$	Cl	Cl	A-71	$SO_2CH_2CH_3$	Cl	Cl
A-68	$SO_2CH_2CH_2CH_3$	Cl	CH_3	A-71	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-68	$SO_2CH_2CH_2CH_3$	Cl	Cl	A-71	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-68	$SO_2N(CH_3)_2$	CH_3	CH_3	A-71	$SO_2N(CH_3)_2$	CH_3	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	CH_3	A-71	$SO_2N(CH_3)_2$	Cl	CH_3
A-68	$SO_2N(CH_3)_2$	Cl	Cl	A-71	$SO_2N(CH_3)_2$	Cl	Cl
A-68	SO_2CF_3	CH_3	CH_3	A-71	SO_2CF_3	CH_3	CH_3
A-68	SO_2CF_3	Cl	CH_3	A-71	SO_2CF_3	Cl	CH_3
A-68	SO_2CF_3	Cl	Cl	A-71	SO_2CF_3	Cl	Cl
A-68	$SO_2OCH_2CF_3$	CH_3	CH_3	A-71	$SO_2OCH_2CF_3$	CH_3	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	CH_3	A-71	$SO_2OCH_2CF_3$	Cl	CH_3
A-68	$SO_2OCH_2CF_3$	Cl	Cl	A-71	$SO_2OCH_2CF_3$	Cl	Cl
A-68	CF_3	CH_3	CH_3	A-71	CF_3	CH_3	CH_3
A-68	CF_3	Cl	CH_3	A-71	CF_3	Cl	CH_3
A-68	CF_3	Cl	Cl	A-71	CF_3	Cl	Cl
A-68	OCH_3	CH_3	CH_3	A-71	OCH_3	CH_3	CH_3

A-68	OCH_3	Cl	CH_3
A-68	OCH_3	Cl	Cl
A-68	NO_2	CH_3	CH_3
A-68	NO_2	Cl	CH_3
A-68	NO_2	Cl	Cl
A-78	SO_2CH_3	NO_2	CH_3
A-78	SO_2CH_3	Cl	CH_3
A-78	SO_2CH_3	Cl	Cl
A-78	$SO_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_3$	Cl	Cl
A-78	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-78	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-78	$SO_2N(CH_3)_2$	CH_3	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	CH_3
A-78	$SO_2N(CH_3)_2$	Cl	Cl
A-78	SO_2CF_3	CH_3	CH_3
A-78	SO_2CF_3	Cl	CH_3
A-78	SO_2CF_3	Cl	Cl
A-78	$SO_2OCH_2CF_3$	CH_3	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	CH_3
A-78	$SO_2OCH_2CF_3$	Cl	Cl
A-78	CF_3	CH_3	CH_3
A-78	CF_3	Cl	CH_3
A-78	CF_3	Cl	Cl
A-78	OCH_3	CH_3	CH_3
A-78	OCH_3	Cl	CH_3
A-78	OCH_3	Cl	Cl
A-78	NO_2	CH_3	CH_3
A-78	NO_2	Cl	CH_3
A-78	NO_2	Cl	Cl

A-71	OCH_3	Cl	CH_3
A-71	OCH_3	Cl	Cl
A-71	NO_2	CH_3	CH_3
A-71	NO_2	Cl	CH_3
A-71	NO_2	Cl	Cl
A-91	SO_2CH_3	NO_2	CH_3
A-91	SO_2CH_3	Cl	CH_3
A-91	SO_2CH_3	Cl	Cl
A-91	$SO_2CH_2CH_3$	Cl	CH_3
A-91	$SO_2CH_2CH_3$	Cl	Cl
A-91	$SO_2CH_2CH_2CH_3$	Cl	CH_3
A-91	$SO_2CH_2CH_2CH_3$	Cl	Cl
A-91	$SO_2N(CH_3)_2$	CH_3	CH_3
A-91	$SO_2N(CH_3)_2$	Cl	CH_3
A-91	$SO_2N(CH_3)_2$	Cl	Cl
A-91	SO_2CF_3	CH_3	CH_3
A-91	SO_2CF_3	Cl	CH_3
A-91	SO_2CF_3	Cl	Cl
A-91	$SO_2OCH_2CF_3$	CH_3	CH_3
A-91	$SO_2OCH_2CF_3$	Cl	CH_3
A-91	$SO_2OCH_2CF_3$	Cl	Cl
A-91	CF_3	CH_3	CH_3
A-91	CF_3	Cl	CH_3
A-91	CF_3	Cl	Cl
A-91	OCH_3	CH_3	CH_3
A-91	OCH_3	Cl	CH_3
A-91	OCH_3	Cl	Cl
A-91	NO_2	CH_3	CH_3
A-91	NO_2	Cl	CH_3
A-91	NO_2	Cl	Cl

TABLE 11



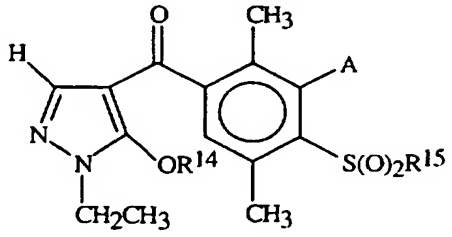
A	R^{15}	R^{14}	A	R^{15}	R^{14}
A-1	CH_3	PhC(=O)	A-2	CH_3	PhC(=O)
A-1	CH_3	4-CH_3PhC(=O)	A-2	CH_3	4-CH_3PhC(=O)
A-1	CH_3	$CH_3S(O)_2$	A-2	CH_3	$CH_3S(O)_2$
A-1	CH_3	$CH_3CH_2S(O)_2$	A-2	CH_3	$CH_3CH_2S(O)_2$
A-1	CH_3	$CH_3CH_2CH_2S(O)_2$	A-2	CH_3	$CH_3CH_2CH_2S(O)_2$
A-1	CH_3	$PhS(O)_2$	A-2	CH_3	$PhS(O)_2$
A-1	CH_3	4-$CH_3PhS(O)_2$	A-2	CH_3	4-$CH_3PhS(O)_2$
A-1	CH_3	Na	A-2	CH_3	Na
A-1	CH_3	K	A-2	CH_3	K
A-3	CH_3	PhC(=O)	A-33	CH_3	PhC(=O)
A-3	CH_3	4-CH_3PhC(=O)	A-33	CH_3	4-CH_3PhC(=O)
A-3	CH_3	$CH_3S(O)_2$	A-33	CH_3	$CH_3S(O)_2$
A-3	CH_3	$CH_3CH_2S(O)_2$	A-33	CH_3	$CH_3CH_2S(O)_2$
A-3	CH_3	$CH_3CH_2CH_2S(O)_2$	A-33	CH_3	$CH_3CH_2CH_2S(O)_2$
A-3	CH_3	$PhS(O)_2$	A-33	CH_3	$PhS(O)_2$
A-3	CH_3	4-$CH_3PhS(O)_2$	A-33	CH_3	4-$CH_3PhS(O)_2$
A-3	CH_3	Na	A-33	CH_3	Na
A-3	CH_3	K	A-33	CH_3	K
A-67	CH_3	PhC(=O)	A-71	CH_3	PhC(=O)
A-67	CH_3	4-CH_3PhC(=O)	A-71	CH_3	4-CH_3PhC(=O)
A-67	CH_3	$CH_3S(O)_2$	A-71	CH_3	$CH_3S(O)_2$
A-67	CH_3	$CH_3CH_2S(O)_2$	A-71	CH_3	$CH_3CH_2S(O)_2$
A-67	CH_3	$CH_3CH_2CH_2S(O)_2$	A-71	CH_3	$CH_3CH_2CH_2S(O)_2$
A-67	CH_3	$PhS(O)_2$	A-71	CH_3	$PhS(O)_2$
A-67	CH_3	4-$CH_3PhS(O)_2$	A-71	CH_3	4-$CH_3PhS(O)_2$
A-67	CH_3	Na	A-71	CH_3	Na
A-67	CH_3	K	A-71	CH_3	K
A-1	CH_2CH_3	PhC(=O)	A-2	CH_2CH_3	PhC(=O)

A-1	CH_2CH_3	4-CH_3PhC(=O)
A-1	CH_2CH_3	$CH_3S(O)_2$
A-1	CH_2CH_3	$CH_3CH_2S(O)_2$
A-1	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-1	CH_2CH_3	$PhS(O)_2$
A-1	CH_2CH_3	4-CH_3PhS$(O)_2$
A-1	CH_2CH_3	Na
A-1	CH_2CH_3	K
A-3	CH_2CH_3	PhC(=O)
A-3	CH_2CH_3	4-CH_3PhC(=O)
A-3	CH_2CH_3	$CH_3S(O)_2$
A-3	CH_2CH_3	$CH_3CH_2S(O)_2$
A-3	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-3	CH_2CH_3	$PhS(O)_2$
A-3	CH_2CH_3	4-CH_3PhS$(O)_2$
A-3	CH_2CH_3	Na
A-3	CH_2CH_3	K
A-67	CH_2CH_3	PhC(=O)
A-67	CH_2CH_3	4-CH_3PhC(=O)
A-67	CH_2CH_3	$CH_3S(O)_2$
A-67	CH_2CH_3	$CH_3CH_2S(O)_2$
A-67	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-67	CH_2CH_3	$PhS(O)_2$
A-67	CH_2CH_3	4-CH_3PhS$(O)_2$
A-67	CH_2CH_3	Na
A-67	CH_2CH_3	K
A-1	$CH_2CH_2CH_3$	PhC(=O)
A-1	$CH_2CH_2CH_3$	4-CH_3PhC(=O)
A-1	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-1	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-1	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-1	$CH_2CH_2CH_3$	$PhS(O)_2$
A-1	$CH_2CH_2CH_3$	4-CH_3PhS$(O)_2$
A-1	$CH_2CH_2CH_3$	Na
A-1	$CH_2CH_2CH_3$	K
A-3	$CH_2CH_2CH_3$	PhC(=O)
A-3	$CH_2CH_2CH_3$	4-CH_3PhC(=O)
A-3	$CH_2CH_2CH_3$	$CH_3S(O)_2$

A-2	CH_2CH_3	4-CH_3PhC(=O)
A-2	CH_2CH_3	$CH_3S(O)_2$
A-2	CH_2CH_3	$CH_3CH_2S(O)_2$
A-2	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-2	CH_2CH_3	$PhS(O)_2$
A-2	CH_2CH_3	4-CH_3PhS$(O)_2$
A-2	CH_2CH_3	Na
A-2	CH_2CH_3	K
A-33	CH_2CH_3	PhC(=O)
A-33	CH_2CH_3	4-CH_3PhC(=O)
A-33	CH_2CH_3	$CH_3S(O)_2$
A-33	CH_2CH_3	$CH_3CH_2S(O)_2$
A-33	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-33	CH_2CH_3	$PhS(O)_2$
A-33	CH_2CH_3	4-CH_3PhS$(O)_2$
A-33	CH_2CH_3	Na
A-33	CH_2CH_3	K
A-71	CH_2CH_3	PhC(=O)
A-71	CH_2CH_3	4-CH_3PhC(=O)
A-71	CH_2CH_3	$CH_3S(O)_2$
A-71	CH_2CH_3	$CH_3CH_2S(O)_2$
A-71	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-71	CH_2CH_3	$PhS(O)_2$
A-71	CH_2CH_3	4-CH_3PhS$(O)_2$
A-71	CH_2CH_3	Na
A-71	CH_2CH_3	K
A-2	$CH_2CH_2CH_3$	PhC(=O)
A-2	$CH_2CH_2CH_3$	4-CH_3PhC(=O)
A-2	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-2	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-2	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-2	$CH_2CH_2CH_3$	$PhS(O)_2$
A-2	$CH_2CH_2CH_3$	4-CH_3PhS$(O)_2$
A-2	$CH_2CH_2CH_3$	Na
A-2	$CH_2CH_2CH_3$	K
A-33	$CH_2CH_2CH_3$	PhC(=O)
A-33	$CH_2CH_2CH_3$	4-CH_3PhC(=O)
A-33	$CH_2CH_2CH_3$	$CH_3S(O)_2$

A-3	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$	A-33	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-3	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$	A-33	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-3	$CH_2CH_2CH_3$	$PhS(O)_2$	A-33	$CH_2CH_2CH_3$	$PhS(O)_2$
A-3	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$	A-33	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-3	$CH_2CH_2CH_3$	Na	A-33	$CH_2CH_2CH_3$	Na
A-3	$CH_2CH_2CH_3$	K	A-33	$CH_2CH_2CH_3$	K
A-67	$CH_2CH_2CH_3$	PhC(=O)	A-71	$CH_2CH_2CH_3$	PhC(=O)
A-67	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$	A-71	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-67	$CH_2CH_2CH_3$	$CH_3S(O)_2$	A-71	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-67	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$	A-71	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-67	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$	A-71	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-67	$CH_2CH_2CH_3$	$PhS(O)_2$	A-71	$CH_2CH_2CH_3$	$PhS(O)_2$
A-67	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$	A-71	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-67	$CH_2CH_2CH_3$	Na	A-71	$CH_2CH_2CH_3$	Na
A-67	$CH_2CH_2CH_3$	K	A-71	$CH_2CH_2CH_3$	K

TABLE 12



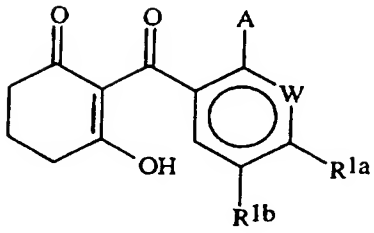
A	R^{15}	R^{14}	A	R^{15}	R^{14}
A-1	CH_3	PhC(=O)	A-2	CH_3	PhC(=O)
A-1	CH_3	$4\text{-}CH_3PhC(=O)$	A-2	CH_3	$4\text{-}CH_3PhC(=O)$
A-1	CH_3	$CH_3S(O)_2$	A-2	CH_3	$CH_3S(O)_2$
A-1	CH_3	$CH_3CH_2S(O)_2$	A-2	CH_3	$CH_3CH_2S(O)_2$
A-1	CH_3	$CH_3CH_2CH_2S(O)_2$	A-2	CH_3	$CH_3CH_2CH_2S(O)_2$
A-1	CH_3	$PhS(O)_2$	A-2	CH_3	$PhS(O)_2$
A-1	CH_3	$4\text{-}CH_3PhS(O)_2$	A-2	CH_3	$4\text{-}CH_3PhS(O)_2$
A-1	CH_3	Na	A-2	CH_3	Na
A-1	CH_3	K	A-2	CH_3	K
A-3	CH_3	PhC(=O)	A-33	CH_3	PhC(=O)
A-3	CH_3	$4\text{-}CH_3PhC(=O)$	A-33	CH_3	$4\text{-}CH_3PhC(=O)$
A-3	CH_3	$CH_3S(O)_2$	A-33	CH_3	$CH_3S(O)_2$

A-3	CH_3	$CH_3CH_2S(O)_2$
A-3	CH_3	$CH_3CH_2CH_2S(O)_2$
A-3	CH_3	$PhS(O)_2$
A-3	CH_3	4-$CH_3PhS(O)_2$
A-3	CH_3	Na
A-3	CH_3	K
A-67	CH_3	PhC(=O)
A-67	CH_3	4-CH_3PhC(=O)
A-67	CH_3	$CH_3S(O)_2$
A-67	CH_3	$CH_3CH_2S(O)_2$
A-67	CH_3	$CH_3CH_2CH_2S(O)_2$
A-67	CH_3	$PhS(O)_2$
A-67	CH_3	4-$CH_3PhS(O)_2$
A-67	CH_3	Na
A-67	CH_3	K
A-1	CH_2CH_3	PhC(=O)
A-1	CH_2CH_3	4-CH_3PhC(=O)
A-1	CH_2CH_3	$CH_3S(O)_2$
A-1	CH_2CH_3	$CH_3CH_2S(O)_2$
A-1	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-1	CH_2CH_3	$PhS(O)_2$
A-1	CH_2CH_3	4-$CH_3PhS(O)_2$
A-1	CH_2CH_3	Na
A-1	CH_2CH_3	K
A-3	CH_2CH_3	PhC(=O)
A-3	CH_2CH_3	4-CH_3PhC(=O)
A-3	CH_2CH_3	$CH_3S(O)_2$
A-3	CH_2CH_3	$CH_3CH_2S(O)_2$
A-3	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-3	CH_2CH_3	$PhS(O)_2$
A-3	CH_2CH_3	4-$CH_3PhS(O)_2$
A-3	CH_2CH_3	Na
A-3	CH_2CH_3	K
A-67	CH_2CH_3	PhC(=O)
A-67	CH_2CH_3	4-CH_3PhC(=O)
A-67	CH_2CH_3	$CH_3S(O)_2$
A-67	CH_2CH_3	$CH_3CH_2S(O)_2$
A-67	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$

A-33	CH_3	$CH_3CH_2S(O)_2$
A-33	CH_3	$CH_3CH_2CH_2S(O)_2$
A-33	CH_3	$PhS(O)_2$
A-33	CH_3	4-$CH_3PhS(O)_2$
A-33	CH_3	Na
A-33	CH_3	K
A-71	CH_3	PhC(=O)
A-71	CH_3	4-CH_3PhC(=O)
A-71	CH_3	$CH_3S(O)_2$
A-71	CH_3	$CH_3CH_2S(O)_2$
A-71	CH_3	$CH_3CH_2CH_2S(O)_2$
A-71	CH_3	$PhS(O)_2$
A-71	CH_3	4-$CH_3PhS(O)_2$
A-71	CH_3	Na
A-71	CH_3	K
A-2	CH_2CH_3	PhC(=O)
A-2	CH_2CH_3	4-CH_3PhC(=O)
A-2	CH_2CH_3	$CH_3S(O)_2$
A-2	CH_2CH_3	$CH_3CH_2S(O)_2$
A-2	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-2	CH_2CH_3	$PhS(O)_2$
A-2	CH_2CH_3	4-$CH_3PhS(O)_2$
A-2	CH_2CH_3	Na
A-2	CH_2CH_3	K
A-33	CH_2CH_3	PhC(=O)
A-33	CH_2CH_3	4-CH_3PhC(=O)
A-33	CH_2CH_3	$CH_3S(O)_2$
A-33	CH_2CH_3	$CH_3CH_2S(O)_2$
A-33	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$
A-33	CH_2CH_3	$PhS(O)_2$
A-33	CH_2CH_3	4-$CH_3PhS(O)_2$
A-33	CH_2CH_3	Na
A-33	CH_2CH_3	K
A-71	CH_2CH_3	PhC(=O)
A-71	CH_2CH_3	4-CH_3PhC(=O)
A-71	CH_2CH_3	$CH_3S(O)_2$
A-71	CH_2CH_3	$CH_3CH_2S(O)_2$
A-71	CH_2CH_3	$CH_3CH_2CH_2S(O)_2$

A-67	CH_2CH_3	$PhS(O)_2$
A-67	CH_2CH_3	$4\text{-}CH_3PhS(O)_2$
A-67	CH_2CH_3	Na
A-67	CH_2CH_3	K
A-1	$CH_2CH_2CH_3$	PhC(=O)
A-1	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-1	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-1	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-1	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-1	$CH_2CH_2CH_3$	$PhS(O)_2$
A-1	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-1	$CH_2CH_2CH_3$	Na
A-1	$CH_2CH_2CH_3$	K
A-3	$CH_2CH_2CH_3$	PhC(=O)
A-3	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-3	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-3	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-3	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-3	$CH_2CH_2CH_3$	$PhS(O)_2$
A-3	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-3	$CH_2CH_2CH_3$	Na
A-3	$CH_2CH_2CH_3$	K
A-67	$CH_2CH_2CH_3$	PhC(=O)
A-67	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-67	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-67	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-67	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-67	$CH_2CH_2CH_3$	$PhS(O)_2$
A-67	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-67	$CH_2CH_2CH_3$	Na
A-67	$CH_2CH_2CH_3$	K
A-71	CH_2CH_3	$PhS(O)_2$
A-71	CH_2CH_3	$4\text{-}CH_3PhS(O)_2$
A-71	CH_2CH_3	Na
A-71	CH_2CH_3	K
A-2	$CH_2CH_2CH_3$	PhC(=O)
A-2	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-2	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-2	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-2	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-2	$CH_2CH_2CH_3$	$PhS(O)_2$
A-2	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-2	$CH_2CH_2CH_3$	Na
A-2	$CH_2CH_2CH_3$	K
A-33	$CH_2CH_2CH_3$	PhC(=O)
A-33	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-33	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-33	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-33	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-33	$CH_2CH_2CH_3$	$PhS(O)_2$
A-33	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-33	$CH_2CH_2CH_3$	Na
A-33	$CH_2CH_2CH_3$	K
A-71	$CH_2CH_2CH_3$	PhC(=O)
A-71	$CH_2CH_2CH_3$	$4\text{-}CH_3PhC(=O)$
A-71	$CH_2CH_2CH_3$	$CH_3S(O)_2$
A-71	$CH_2CH_2CH_3$	$CH_3CH_2S(O)_2$
A-71	$CH_2CH_2CH_3$	$CH_3CH_2CH_2S(O)_2$
A-71	$CH_2CH_2CH_3$	$PhS(O)_2$
A-71	$CH_2CH_2CH_3$	$4\text{-}CH_3PhS(O)_2$
A-71	$CH_2CH_2CH_3$	Na
A-71	$CH_2CH_2CH_3$	K

TABLE 13



R^{1a} is CF_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60

A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

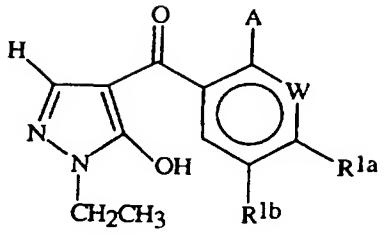
R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 14



R^{1a} is CF_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60

A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

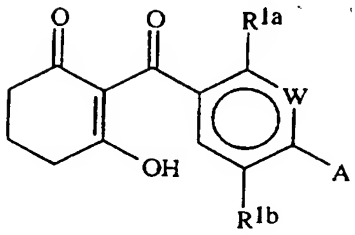
R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 15



R^{1a} is CF_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60

A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

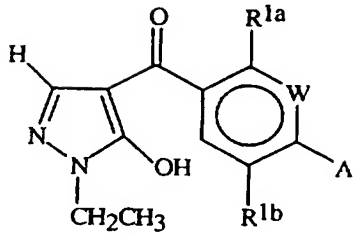
R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 16



R^{1a} is CF_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60

A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is H, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is SO_2CH_3, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is $SO_2CH_2CH_3$, R^{1b} is CN, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24

A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CF_3, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72

A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is Cl, R^{1b} is Cl, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

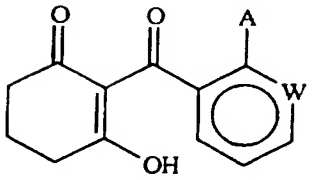
R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

R^{1a} is CH_3, R^{1b} is SO_2CH_3, and W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 17



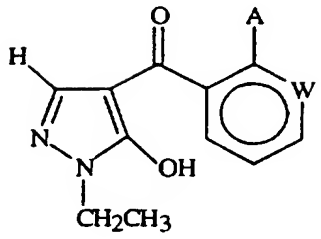
W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 18



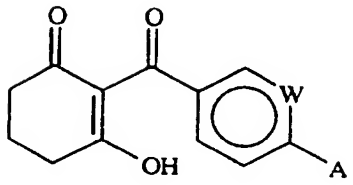
W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 19



W is CH

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
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A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
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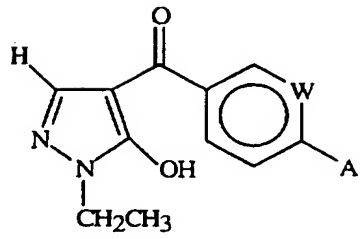
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

TABLE 20



W is CH

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A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

W is N

A	A	A	A	A	A	A	A	A	A	A	A
A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12
A-13	A-14	A-15	A-16	A-17	A-18	A-19	A-20	A-21	A-22	A-23	A-24
A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-36
A-37	A-38	A-39	A-40	A-41	A-42	A-43	A-44	A-45	A-46	A-47	A-48
A-49	A-50	A-51	A-52	A-53	A-54	A-55	A-56	A-57	A-58	A-59	A-60
A-61	A-62	A-63	A-64	A-65	A-66	A-67	A-68	A-69	A-70	A-71	A-72
A-73	A-74	A-75	A-76	A-77	A-78	A-79	A-80	A-81	A-82	A-83	A-84
A-85	A-86	A-87	A-88	A-89	A-90	A-91	A-92	A-93			

Formulation/Utility

Compounds of this invention will generally be used as a formulation or composition with an agriculturally suitable carrier comprising at least one of a liquid diluent, a solid diluent or a surfactant. The formulation or composition ingredients are selected to be consistent with the physical properties of the active ingredient, mode of application and environmental factors such as soil type, moisture and temperature. Useful formulations include liquids such as solutions (including emulsifiable concentrates), suspensions,

emulsions (including microemulsions and/or suspoemulsions) and the like which optionally can be thickened into gels. Useful formulations further include solids such as dusts, powders, granules, pellets, tablets, films, and the like which can be water-dispersible ("wettable") or water-soluble. Active ingredient can be (micro)encapsulated and further formed into a suspension or solid formulation; alternatively the entire formulation of active ingredient can be encapsulated (or "overcoated"). Encapsulation can control or delay release of the active ingredient. Sprayable formulations can be extended in suitable media and used at spray volumes from about one to several hundred liters per hectare. High-strength compositions are primarily used as intermediates for further formulation.

The formulations will typically contain effective amounts of active ingredient, diluent and surfactant within the following approximate ranges which add up to 100 percent by weight.

	Weight Percent		
	Active Ingredient	Diluent	Surfactant
Water-Dispersible and Water-soluble Granules, Tablets and Powders.	5–90	0–94	1–15
Suspensions, Emulsions, Solutions (including Emulsifiable Concentrates)	5–50	40–95	0–15
Dusts	1–25	70–99	0–5
Granules and Pellets	0.01–99	5–99.99	0–15
High Strength Compositions	90–99	0–10	0–2

Typical solid diluents are described in Watkins, et al., *Handbook of Insecticide Dust Diluents and Carriers*, 2nd Ed., Dorland Books, Caldwell, New Jersey. Typical liquid diluents are described in Marsden, *Solvents Guide*, 2nd Ed., Interscience, New York, 1950. *McCutcheon's Detergents and Emulsifiers Annual*, Allured Publ. Corp., Ridgewood, New Jersey, as well as Sisely and Wood, *Encyclopedia of Surface Active Agents*, Chemical Publ. Co., Inc., New York, 1964, list surfactants and recommended uses. All formulations can contain minor amounts of additives to reduce foam, caking, corrosion, microbiological growth and the like, or thickeners to increase viscosity.

Surfactants include, for example, polyethoxylated alcohols, polyethoxylated alkylphenols, polyethoxylated sorbitan fatty acid esters, dialkyl sulfosuccinates, alkyl sulfates, alkylbenzene sulfonates, organosilicones, *N,N*-dialkyltaurates, lignin sulfonates, naphthalene sulfonate formaldehyde condensates, polycarboxylates, and polyoxyethylene/polyoxypropylene block copolymers. Solid diluents include, for example, clays such as bentonite, montmorillonite, attapulgite and kaolin, starch, sugar, silica, talc, diatomaceous earth, urea, calcium carbonate, sodium carbonate and bicarbonate, and sodium sulfate. Liquid diluents include, for example, water, *N,N*-dimethylformamide, dimethyl

sulfoxide, *N*-alkylpyrrolidone, ethylene glycol, polypropylene glycol, paraffins, alkylbenzenes, alkylnaphthalenes, oils of olive, castor, linseed, tung, sesame, corn, peanut, cotton-seed, soybean, rape-seed and coconut, fatty acid esters, ketones such as cyclohexanone, 2-heptanone, isophorone and 4-hydroxy-4-methyl-2-pentanone, and alcohols such as methanol, cyclohexanol, decanol and tetrahydrofurfuryl alcohol.

Solutions, including emulsifiable concentrates, can be prepared by simply mixing the ingredients. Dusts and powders can be prepared by blending and, usually, grinding as in a hammer mill or fluid-energy mill. Suspensions are usually prepared by wet-milling; see, for example, U.S. 3,060,084. Granules and pellets can be prepared by spraying the active material upon preformed granular carriers or by agglomeration techniques. See Browning, "Agglomeration", *Chemical Engineering*, December 4, 1967, pp 147-48, *Perry's Chemical Engineer's Handbook*, 4th Ed., McGraw-Hill, New York, 1963, pages 8-57 and following, and WO 91/13546. Pellets can be prepared as described in U.S. 4,172,714. Water-dispersible and water-soluble granules can be prepared as taught in U.S. 4,144,050, U.S. 3,920,442 and DE 3,246,493. Tablets can be prepared as taught in U.S. 5,180,587, U.S. 5,232,701 and U.S. 5,208,030. Films can be prepared as taught in GB 2,095,558 and U.S. 3,299,566.

For further information regarding the art of formulation, see U.S. 3,235,361, Col. 6, line 16 through Col. 7, line 19 and Examples 10-41; U.S. 3,309,192, Col. 5, line 43 through Col. 7, line 62 and Examples 8, 12, 15, 39, 41, 52, 53, 58, 132, 138-140, 162-164, 166, 167 and 169-182; U.S. 2,891,855, Col. 3, line 66 through Col. 5, line 17 and Examples 1-4; Klingman, *Weed Control as a Science*, John Wiley and Sons, Inc., New York, 1961, pp 81-96; and Hance et al., *Weed Control Handbook*, 8th Ed., Blackwell Scientific Publications, Oxford, 1989.

In the following Examples, all percentages are by weight and all formulations are prepared in conventional ways. Compound numbers refer to compounds in Index Tables A-C.

Example A

High Strength Concentrate

Compound 1	98.5%
silica aerogel	0.5%
synthetic amorphous fine silica	1.0%.

Example B

Wettable Powder

Compound 15	65.0%
dodecylphenol polyethylene glycol ether	2.0%
sodium ligninsulfonate	4.0%
sodium silicoaluminate	6.0%
montmorillonite (calcined)	23.0%.

Example C

Granule

Compound 25	10.0%
attapulgite granules (low volatile matter, 0.71/0.30 mm; U.S.S. No. 25–50 sieves)	90.0%.

Example D

Extruded Pellet

Compound 26	25.0%
anhydrous sodium sulfate	10.0%
crude calcium ligninsulfonate	5.0%
sodium alkylnaphthalenesulfonate	1.0%
calcium/magnesium bentonite	59.0%.

Test results indicate that the compounds of the present invention are highly active preemergent and postemergent herbicides or plant growth regulants. Many of them have utility for broad-spectrum pre- and/or postemergence weed control in areas where complete control of all vegetation is desired such as around fuel storage tanks, industrial storage areas, parking lots, drive-in theaters, air fields, river banks, irrigation and other waterways, around billboards and highway and railroad structures. Some of the compounds are useful for the control of selected grass and broadleaf weeds with tolerance to important agronomic crops which include but are not limited to alfalfa, barley, cotton, wheat, rape, sugar beets, corn (maize), sorghum, soybeans, rice, oats, peanuts, vegetables, tomato, potato, perennial plantation crops including coffee, cocoa, oil palm, rubber, sugarcane, citrus, grapes, fruit trees, nut trees, banana, plantain, pineapple, hops, tea and forests such as eucalyptus and conifers (e.g., loblolly pine), and turf species (e.g., Kentucky bluegrass, St. Augustine grass, Kentucky fescue and Bermuda grass). Those skilled in the art will appreciate that not all compounds are equally effective against all weeds. Alternatively, the subject compounds are useful to modify plant growth.

A herbicidally effective amount of the compounds of this invention is determined by a number of factors. These factors include: formulation selected, method of application, amount and type of vegetation present, growing conditions, etc. In general, a herbicidally effective amount of compounds of this invention is 0.001 to 20 kg/ha with a preferred range

of 0.004 to 1.0 kg/ha. One skilled in the art can easily determine the herbicidally effective amount necessary for the desired level of weed control.

Compounds of this invention can be used alone or in combination with other commercial herbicides, insecticides or fungicides. Compounds of this invention can also be used in combination with commercial herbicide safeners such as benoxacor, dichlormid and furilazole to increase safety to certain crops. A mixture of one or more of the following herbicides with a compound of this invention may be particularly useful for weed control: acetochlor, acifluorfen and its sodium salt, aclonifen, acrolein (2-propenal), alachlor, ametryn, amidosulfuron, amitrole, ammonium sulfamate, anilofos, asulam, atrazine, azafenidin, azimsulfuron, benazolin, benazolin-ethyl, benfluralin, benfuresate, bensulfuron-methyl, bensulide, bentazone, bifenox, bispyribac and its sodium salt, bromacil, bromoxynil, bromoxynil octanoate, butachlor, butralin, butroxydim (ICIA0500), butylate, caloxydim (BAS 620H), carfentrazone-ethyl, chlomethoxyfen, chloramben, chlorbromuron, chloridazon, chlorimuron-ethyl, chlornitrofen, chlorotoluron, chlorpropham, chlorsulfuron, chlorthal-dimethyl, cinmethylin, cinosulfuron, clethodim, clomazone, clopyralid, clopyralid-olamine, cyanazine, cycloate, cyclosulfamuron, 2,4-D and its butotyl, butyl, isoctyl and isopropyl esters and its dimethylammonium, diolamine and trolamine salts, daimuron, dalapon, dalapon-sodium, dazomet, 2,4-DB and its dimethylammonium, potassium and sodium salts, desmedipham, desmetryn, dicamba and its diglycolammonium, dimethylammonium, potassium and sodium salts, dichlobenil, dichlorprop, diclofop-methyl, 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid (AC 263,222), difenzoquat metilsulfate, diflufenican, dimepiperate, dimethenamid, dimethylarsinic acid and its sodium salt, dinitramine, diphenamid, diquat dibromide, dithiopyr, diuron, DNOC, endothal, EPTC, esprocarb, ethalfluralin, ethametsulfuron-methyl, ethofumesate, ethoxysulfuron, fenoxaprop-ethyl, fenoxaprop-P-ethyl, fenuron, fenuron-TCA, flamprop-methyl, flamprop-M-isopropyl, flamprop-M-methyl, flazasulfuron, fluazifop-butyl, fluazifop-P-butyl, fluchloralin, flumetsulam, flumiclorac-pentyl, flumioxazin, fluometuron, fluoroglycofen-ethyl, flupoxam, flupyrsulfuron-methyl and its sodium salt, fluridone, flurochloridone, fluroxypyr, fluthiacet-methyl, fomesafen, fosamine-ammonium, glufosinate, glufosinate-ammonium, glyphosate, glyphosate-isopropylammonium, glyphosate-sesquisodium, glyphosate-trimesium, halosulfuron-methyl, haloxyfop-etotyl, haloxyfop-methyl, hexazinone, imazamethabenz-methyl, imazamox, imazapyr, imazaquin, imazaquin-ammonium, imazethapyr, imazethapyr-ammonium, imazosulfuron, ioxynil, ioxynil octanoate, ioxynil-sodium, isoproturon, isouron, isoxaben, isoxaflutole, lactofen, lenacil, linuron, maleic hydrazide, MCPA and its dimethylammonium, potassium and sodium salts, MCPA-isoctyl, mecoprop, mecoprop-P, mefenacet, mefluidide, metam-sodium, methabenzthiazuron, methylarsonic acid and its calcium, monoammonium, monosodium and

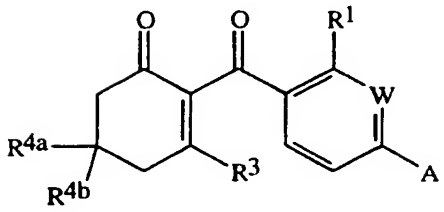
disodium salts, methyl [[[1-[5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrophenyl]-2-methoxyethylidene]amino]oxy]acetate (AKH-7088), methyl 5-[[[[(4,6-dimethyl-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]-1-(2-pyridinyl)-1*H*-pyrazole-4-carboxylate (NC-330), metobenzuron, metolachlor, metosulam, metoxuron, metribuzin, metsulfuron-methyl, molinate, monolinuron, napropamide, naptalam, neburon, nicosulfuron, norflurazon, oryzalin, oxadiazon, oxasulfuron, oxyfluorfen, paraquat dichloride, pebulate, pendimethalin, pentoxazone (KPP-314), perfluidone, phenmedipham, picloram, picloram-potassium, pretilachlor, primisulfuron-methyl, prometon, prometryn, propachlor, propanil, propaquizafop, propazine, propham, propyzamide, prosulfuron, pyrazolynate, pyrazosulfuron-ethyl, pyridate, pyriminobac-methyl, pyrithiobac, pyrithiobac-sodium, quinclorac, quizalofop-ethyl, quizalofop-P-ethyl, quizalofop-P-tefuryl, rimsulfuron, sethoxydim, siduron, simazine, sulcotrione (ICIA0051), sulfentrazone, sulfometuron-methyl, TCA, TCA-sodium, tebuthiuron, terbacil, terbuthylazine, terbutryn, thenylchlor, thiafluamide (BAY 11390), thifensulfuron-methyl, thiobencarb, tralkoxydim, tri-allate, triasulfuron, triaziflam, tribenuron-methyl, triclopyr, triclopyr-butotyl, triclopyr-triethylammonium, tridiphane, trifluralin, triflusulfuron-methyl, and vernolate.

In certain instances, combinations with other herbicides having a similar spectrum of control but a different mode of action will be particularly advantageous for preventing the development of resistant weeds.

Preferred for better control of undesired vegetation (e.g., lower use rate, broader spectrum of weeds controlled, or enhanced crop safety) or for preventing the development of resistant weeds are mixtures of a compound of this invention with a herbicide selected from the group nicosulfuron, rimsulfuron, nicosulfuron in combination with rimsulfuron, imazethapyr, sethoxydim, glyphosate, and glufosinate.

The following Tests demonstrate the control efficacy of the compounds of this invention against specific weeds. The weed control afforded by the compounds is not limited, however, to these species. See Index Tables A-D for compound descriptions. The abbreviation "dec." indicates that the compound appeared to decompose on melting. The abbreviation "Ex." stands for "Example" and is followed by a number indicating in which example the compound is prepared.

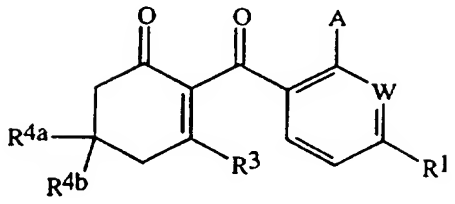
INDEX TABLE A



Cmpd	R^{4a}	R^{4b}	R^3	R^1	W	A	m.p. (°C)
1	H	H	OH	Cl	CH	4-pyridyl	oil*
2	CH_3	CH_3	$O^-Et_3NH^+$	Cl	CH	4-pyridyl	oil*
3	CH_3	CH_3	OH	Cl	CH	4-pyridyl	oil*
4	CH_3	H	$O^-Et_3NH^+$	Cl	CH	4-pyridyl	oil*
5	CH_3	H	OH	Cl	CH	4-pyridyl	oil*
6	H	H	$O^-Et_3NH^+$	Cl	CH	3-CF_3-1*H*-pyrazol-1-yl	oil*
7	H	H	OH	Cl	CH	3-CF_3-1*H*-pyrazol-1-yl	97-108
8	H	H	$O^-Et_3NH^+$	Cl	CH	4-pyridyl	oil*
9	H	H	$O^-Et_3NH^+$	Cl	CH	2-pyridyl	oil*
10	H	H	$O^-Et_3NH^+$	CH_3	CH	2-thiazolyl	oil*
11	H	H	OH	CH_3	CH	2-thiazolyl	oil*
12	H	H	$O^-Et_3NH^+$	Cl	CH	3-pyridyl	oil*
13	H	H	OH	Cl	CH	3-pyridyl	110-115

*See Index Table D for ^1H NMR data.

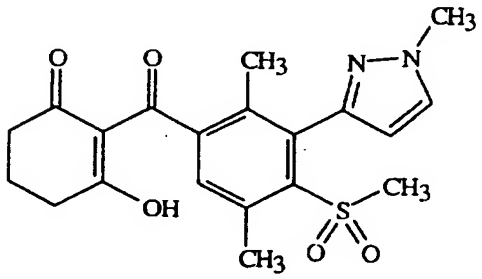
INDEX TABLE B

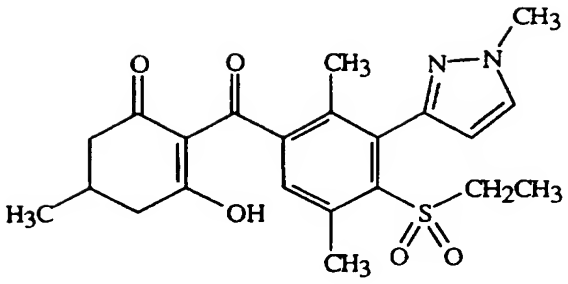
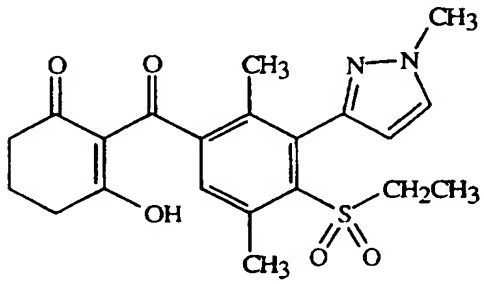
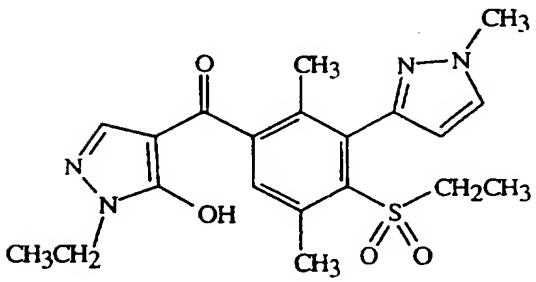
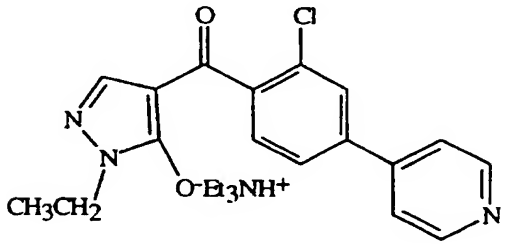
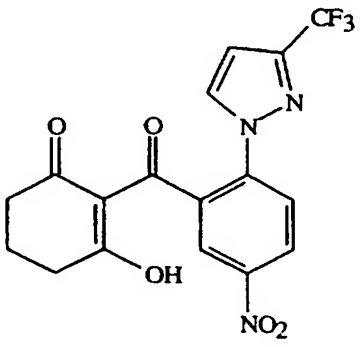


Cmpd	R^{4a}	R^{4b}	R^3	R^1	W	A	m.p. (°C)
14	H	H	$O^-Et_3NH^+$	CF_3	N	4-pyridyl	oil*
15 (Ex. 3)	H	H	OH	CF_3	N	4-pyridyl	137-145
19	H	H	$O^-Et_3NH^+$	$(CH_3)_2CHCH_2CH_2$	N	4-pyridyl	oil*
20	H	H	OH	CF_3	N	2-pyridyl	126-131
21	CH_3	CH_3	OH	CF_3	N	2-pyridyl	oil*
22	H	H	OH	CF_3	N	3-pyridyl	oil*
23 (Ex. 2)	H	H	OH	H	CH	3-CF_3-1*H*-pyrazol-1-yl	141-143
24	H	H	OH	CF_3	CH	3-CF_3-1*H*-pyrazol-1-yl	123-126

*See Index Table D for ^1H NMR data.

INDEX TABLE C

Cmpd No.	Structure	m.p. (°C)
25 (Ex. 1)		93 (dec.)

26		oil*
27		oil*
28		90-91
29		oil*
30		218-220

*See Index Table D for ^{1}H NMR data.

INDEX TABLE D

Cmpd No.	^{1}H NMR Data ($CDCl_3$ solution unless indicated otherwise)[a]
1	δ 9.7 (m, 2H), 7.63 (m, 2H), 7.62 (m, 1H), 7.6 (s, 1H), 7.37 (m, 1H), 2.8 (m, 2H), 2.5 (m, 2H), 2.08 (m, 2H).
2	δ 8.65 (d, 2H), 7.6 (d, 1H), 7.5 (m, 3H), 7.27 (m, 1H), 3.13 (m, 6H), 2.32 (s, 4H), 1.3 (m, 9H), 1.04 (s, 6H).
3	δ 8.8 (m, 2H), 7.84 (m, 2H), 7.69 (m, 2H), 7.38 (d, 1H), 2.4 (m, 2H), 1.2 (m, 2H), 1.04 (d, 6H).
4	δ 8.62 (d, 2H), 7.6 (s, 1H), 7.5 (m, 3H), 7.28 (d, 1H), 3.17 (m, 6H), 2.5 (d, 2H), 2.2 (d, 1H), 1.7 (m, 1H), 1.31 (m, 9H), 1.03 (d, 3H).
5	δ 8.72 (m, 2H), 7.65 (m, 3H), 7.5 (d, 1H), 7.3 (d, 1H), 2.6-2.0 (m, 4H), 1.6 (m, 1H), 1.13 (d, 6H).
6	δ 7.9 (s, 1H), 7.7 (s, 1H), 7.5 (d, 1H), 7.28 (d, 1H), 6.8 (s, 1H), 3.18 (m, 6H), 2.42 (m, 4H), 1.98 (m, 2H), 1.29 (m, 9H).
8	δ 8.63 (d, 2H), 7.48 (s, 1H), 7.46 (m, 3H), 7.2 (d, 1H), 3.15 (m, 6H), 2.43 (m, 4H), 1.98 (m, 2H), 1.29 (m, 9H).
9	δ 8.7 (m, 1H), 8.0 (s, 1H), 7.8 (d, 1H), 7.72 (m, 1H), 7.70 (m, 1H), 7.26 (m, 1H), 3.14 (m, 6H), 2.45 (m, 4H), 1.99 (m, 2H), 1.26 (m, 9H).
10	δ 7.8 (d, 1H), 7.77 (s, 1H), 7.6 (d, 1H), 7.3 (m, 1H), 7.18 (d, 1H), 3.09 (m, 6H), 2.45 (m, 4H), 2.34 (s, 3H), 1.99 (m, 2H), 1.26 (m, 9H).
11	δ 7.88 (m, 2H), 7.85 (m, 1H), 7.33 (s, 1H), 7.16 (d, 1H), 2.71 (m, 2H), 2.4 (m, 2H), 2.33 (s, 3H), 2.0 (m, 2H).
12	δ 8.8 (s, 1H), 8.6 (d, 1H), 7.8 (dd, 1H), 7.5 (s, 1H), 7.4 (d, 1H), 7.35 (m, 1H), 7.24 (d, 1H), 3.21 (m, 6H), 2.45 (m, 4H), 1.99 (m, 2H), 1.28 (m, 9H).
14	δ 8.6 (d, 1H), 8.55 (d, 1H), 7.8 (d, 1H), 7.5 (m, 3H), 3.0 (m, 6H), 2.33 (m, 4H), 1.8 (m, 2H), 1.16 (m, 9H).
19	δ 8.6 (m, 2H), 7.7 (m, 1H), 7.65 (m, 1H), 7.5 (m, 1H), 7.2 (m, 1H), 2.95 (m, 6H), 2.9 (m, 1H), 2.3 (m, 2H), 1.6 (m, 2H), 1.13 (m, 9H), 0.95 (m, 6H).
21	δ 8.47 (m, 1H), 8.44 (m, 1H), 7.8 (m, 1H), 7.73 (m, 1H), 7.7 (m, 1H), 7.25 (m, 1H), 2.6 (m, 1H), 2.02 (m, 2H), 0.92 (m, 6H).
22	δ 8.6 (m, 2H), 8.0 (m, 1H), 7.77 (m, 1H), 7.6 (m, 1H), 7.4 (m, 1H), 3.2-1.8 (m, 6H).
26	δ 7.57 (d, 1H), 7.1 (s, 1H), 6.1 (d, 1H), 3.67 (s, 3H), 3.2-2.1 (m, 10H), 1.73 (s, 3H), 1.29 (t, 3H), 1.13 (d, 3H).
27	δ 7.56 (d, 1H), 7.1 (s, 1H), 6.11 (d, 1H), 3.67 (s, 3H), 3.2-3.0 (m, 2H), 2.82 (t, 2H), 2.74 (s, 3H), 2.42 (t, 2H), 2.14-2.0 (m, 2H), 1.74 (s, 3H), 1.29 (t, 3H).

29 δ 8.7 (m, 2H), 7.7-7.4 (m, 5H), 7.09 (s, 1H), 3.9 (q, 2H), 3.24 (m, 6H), 1.35 (m, 12H).

[a] ^{1}H NMR data are in ppm downfield from tetramethylsilane. Couplings are designated by (s)-singlet, (d)-doublet, (dd)-doublet of doublets, (t)-triplet, (q)-quartet, (m)-multiplet.

BIOLOGICAL EXAMPLES OF THE INVENTION

TEST A

Seeds of barley (*Hordeum vulgare*), barnyardgrass (*Echinochloa crus-galli*), bedstraw (*Galium aparine*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), cocklebur (*Xanthium strumarium*), corn (*Zea mays*), cotton (*Gossypium hirsutum*), crabgrass (*Digitaria sanguinalis*), downy brome (*Bromus tectorum*), giant foxtail (*Setaria faberii*), lambsquarters (*Chenopodium album*), morningglory (*Ipomoea hederacea*), rape (*Brassica napus*), rice (*Oryza sativa*), sorghum (*Sorghum bicolor*), soybean (*Glycine max*), sugar beet (*Beta vulgaris*), velvetleaf (*Abutilon theophrasti*), wheat (*Triticum aestivum*), wild buckwheat (*Polygonum convolvulus*), wild oat (*Avena fatua*) and purple nutsedge (*Cyperus rotundus*) tubers were planted and treated preemergence with test chemicals formulated in a non-phytotoxic solvent mixture which includes a surfactant.

At the same time, these crop and weed species were also treated with postemergence applications of test chemicals formulated in the same manner. Plants ranged in height from two to eighteen cm (one to four leaf stage) for postemergence treatments. Treated plants and controls were maintained in a greenhouse for twelve to sixteen days, after which all species were compared to controls and visually evaluated. Plant response ratings, summarized in Table A, are based on a scale of 0 to 10 where 0 is no effect and 10 is complete control. A dash (-) response means no test result.

Table A	COMPOUND
Rate 2000 g/ha	27
Preemergence	
Barley	0
Barnyardgrass	0
Bedstraw	0
Blackgrass	0
Chickweed	0
Cocklebur	0
Corn	0
Cotton	0
Crabgrass	0
Downy brome	0
Giant foxtail	0
Lambsquarter	4
Morningglory	0
Nutsedge	0
Rape	0
Rice	0
Sorghum	0
Soybean	0
Sugar beet	0
Velvetleaf	0
Wheat	0
Wild buckwheat	0
Wild oat	0

Table A	COMPOUND	
Rate 1000 g/ha	20	21
Postemergence		
Barley	0	2
Barnyardgrass	4	5
Bedstraw	9	3
Blackgrass	3	1
Chickweed	7	7
Cocklebur	8	7
Corn	1	1
Cotton	9	3
Crabgrass	2	3
Downy brome	1	0
Giant foxtail	2	1
Lambsquarter	8	9
Morningglory	9	9
Nutsedge	-	0
Rape	9	9
Rice	0	2
Sorghum	3	0
Soybean	8	5
Sugar beet	7	10
Velvetleaf	9	10
Wheat	0	1
Wild buckwheat	2	5
Wild oat	0	0

Table A	COMPOUND	
Rate 1000 g/ha	20	21
Preemergence		
Barley	0	0
Barnyardgrass	0	0
Bedstraw	3	0
Blackgrass	1	0
Chickweed	3	5
Cocklebur	3	0
Corn	0	0
Cotton	2	0
Crabgrass	0	0
Downy brome	0	0
Giant foxtail	0	0
Lambsquarter	9	10
Morningglory	6	2
Nutsedge	0	0
Rape	3	5
Rice	0	0
Sorghum	0	0
Soybean	0	0
Sugar beet	8	10
Velvetleaf	8	7
Wheat	0	0
Wild buckwheat	0	0
Wild oat	0	0

Table A	COMPOUND																		
Rate 400 g/ha	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	19	22	26	27
Postemergence																			
Barley	2	8	8	5	5	0	0	3	1	0	0	5	8	0	1	0	10	0	0
Barnyardgrass	9	10	10	10	10	10	10	9	6	8	9	9	9	9	10	6	10	9	1
Bedstraw	6	8	8	9	6	7	6	8	9	9	9	8	7	9	8	6	10	-	0
Blackgrass	3	6	6	2	3	1	2	1	2	2	4	3	5	0	3	0	10	2	0
Chickweed	7	8	9	7	8	4	5	7	8	7	8	8	9	9	9	9	10	2	0
Cocklebur	9	9	9	9	8	7	7	9	6	8	8	8	9	10	9	8	10	3	0
Corn	4	6	5	3	3	0	3	3	1	2	1	3	2	0	0	0	10	1	1
Cotton	10	6	4	7	8	4	5	10	9	8	9	10	9	9	10	8	9	3	1
Crabgrass	9	10	9	9	10	5	5	9	3	5	8	9	9	3	5	3	10	5	0
Downy brome	0	6	6	3	4	0	0	2	1	1	2	7	7	0	1	0	10	1	0
Giant foxtail	9	7	7	8	8	3	0	8	2	4	6	9	9	3	3	2	9	4	0
Lambsquarter	9	9	9	9	9	7	8	9	9	9	9	9	9	9	9	8	10	8	1
Morningglory	9	9	9	7	7	5	7	9	9	9	9	9	9	9	10	9	10	3	1
Nutsedge	3	-	-	-	-	-	-	2	0	-	3	2	5	7	8	-	8	0	0
Rape	9	9	8	7	7	8	10	9	8	7	8	6	6	9	9	8	10	0	1
Rice	9	9	9	9	9	2	0	8	2	5	9	8	10	4	4	0	9	4	0
Sorghum	7	8	8	6	4	4	3	8	4	3	3	7	9	1	2	0	10	2	1
Soybean	5	6	7	7	4	2	3	7	3	6	8	5	7	7	-	6	7	2	2
Sugar beet	9	10	10	10	10	6	9	9	9	10	9	10	10	10	10	9	10	10	1
Velvetleaf	10	8	9	9	9	8	9	10	10	10	10	10	10	10	10	10	10	3	0
Wheat	3	7	8	4	4	0	0	3	0	0	2	6	8	0	0	0	10	3	0
Wild buckwheat	2	6	8	7	6	5	8	9	6	7	7	10	9	9	9	7	10	7	0
Wild oat	3	8	9	4	6	7	0	4	3	4	5	4	5	0	0	0	10	3	0

Table A	COMPOUND																		
Rate 400 g/ha	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	19	22	26	27
Preemergence																			
Barley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
Barnyardgrass	1	0	0	0	0	0	3	0	0	0	2	0	2	1	8	2	8	0	0
Bedstraw	-	0	5	0	0	0	0	0	0	0	4	0	1	6	7	0	9	-	0
Blackgrass	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	9	0	0
Chickweed	0	0	4	0	0	0	0	2	0	1	0	2	0	8	9	4	9	0	0
Cocklebur	0	0	0	0	0	-	6	0	6	0	0	0	0	6	8	0	10	0	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
Cotton	0	0	0	0	0	0	0	-	0	0	0	0	0	0	5	0	9	0	0
Crabgrass	7	9	3	3	4	6	4	6	0	1	0	5	4	3	3	0	10	0	0
Downy brome	0	0	0	0	0	0	0	3	0	0	0	0	3	0	3	0	9	0	0
Giant foxtail	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2	0	0
Lambsquarter	7	9	9	9	9	6	5	9	8	7	8	9	9	10	10	8	10	6	0
Morningglory	0	0	0	0	0	0	0	2	0	0	0	0	2	7	8	0	10	0	0
Nutsedge	0	3	0	2	0	2	0	0	0	0	0	-	0	-	2	0	8	0	-
Rape	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	1	8	0	0
Rice	1	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	10	0	0
Sorghum	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
Soybean	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	9	0	0
Sugar beet	0	0	3	0	0	0	0	0	0	0	5	3	5	10	10	3	10	0	0
Velvetleaf	6	0	0	0	0	0	6	7	6	2	2	7	8	10	10	4	10	0	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0
Wild buckwheat	0	0	0	3	0	0	0	2	0	0	0	0	0	7	8	0	7	0	0
Wild oat	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	9	0	0

Table A	COMPOUND				
Rate 200 g/ha	20	21	23	24	25
Postemergence					
Barley	0	0	9	9	10
Barnyardgrass	2	1	9	9	10
Bedstraw	6	2	-	-	9
Blackgrass	0	0	7	10	10
Chickweed	4	7	9	9	9
Cocklebur	8	6	10	10	9
Corn	1	0	4	8	9
Cotton	7	2	10	10	9
Crabgrass	2	0	9	9	10
Downy brome	0	0	9	9	9
Giant foxtail	1	0	9	9	10
Lambsquarter	8	8	9	10	9
Morningglory	8	7	9	10	9
Nutsedge	-	0	4	9	4
Rape	4	8	10	10	10
Rice	0	0	9	9	10
Sorghum	1	0	9	9	10
Soybean	4	2	10	10	9
Sugar beet	2	10	10	10	10
Velvetleaf	9	8	10	7	9
Wheat	0	0	9	9	10
Wild buckwheat	2	4	9	8	9
Wild oat	0	0	10	10	10

Table A	COMPOUND				
Rate 200 g/ha	20	21	23	24	25
Preemergence					
Barley	0	0	1	2	0
Barnyardgrass	0	0	9	10	9
Bedstraw	0	0	8	5	8
Blackgrass	0	0	2	4	2
Chickweed	0	0	9	9	9
Cocklebur	-	0	4	5	5
Corn	0	0	0	2	0
Cotton	0	0	0	7	4
Crabgrass	0	0	10	10	10
Downy brome	0	0	7	10	6
Giant foxtail	0	0	3	6	8
Lambsquarter	8	9	10	10	9
Morningglory	1	0	3	6	3
Nutsedge	-	-	0	0	7
Rape	0	0	5	7	8
Rice	0	0	6	9	6
Sorghum	0	0	7	9	3
Soybean	0	0	5	9	4
Sugar beet	0	0	10	10	10
Velvetleaf	1	2	9	10	10
Wheat	0	0	3	5	1
Wild buckwheat	0	0	0	2	0
Wild oat	0	0	8	7	8

Table A	COMPOUND																	
Rate 100 g/ha	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	19	22	26
Postemergence																		
Barley	1	5	4	0	0	0	0	2	0	0	0	2	1	0	0	0	9	0
Barnyardgrass	8	8	8	9	10	9	8	8	4	4	8	9	9	8	9	1	9	9
Bedstraw	4	7	6	8	4	2	3	6	8	8	7	6	7	8	7	2	9	0
Blackgrass	2	3	1	2	1	0	0	1	0	1	1	2	2	0	1	0	9	2
Chickweed	5	6	7	6	5	0	4	4	7	4	5	7	7	8	9	6	10	2
Cocklebur	5	9	7	3	7	5	6	5	5	6	4	6	7	9	9	7	10	2
Corn	3	4	3	0	1	0	0	1	1	1	1	1	0	0	0	0	5	0
Cotton	9	5	4	5	5	3	3	6	9	2	6	9	9	9	9	3	10	2
Crabgrass	7	9	8	9	6	3	5	7	2	2	6	9	9	2	2	0	9	1
Downy brome	0	3	3	1	2	0	0	1	0	0	1	4	4	0	1	0	9	0
Giant foxtail	3	4	4	4	6	1	0	6	1	2	4	8	7	1	1	2	5	2
Lambsquarter	6	9	9	9	7	7	5	9	8	8	8	9	8	9	9	6	10	7
Morningglory	8	8	8	6	5	2	3	9	9	9	9	8	9	9	10	7	10	2
Nutsedge	0	2	1	0	0	0	-	1	0	-	0	0	0	6	5	0	7	0
Rape	2	8	8	5	6	7	7	2	3	4	7	1	5	8	9	7	8	0
Rice	6	8	8	5	8	0	0	4	2	1	3	2	2	2	3	0	10	2
Sorghum	4	5	6	3	2	0	0	5	1	1	2	2	3	0	0	0	-	1
Soybean	3	5	5	5	4	2	2	3	2	2	6	3	5	5	4	3	9	2
Sugar beet	3	10	10	8	9	5	6	5	9	8	8	3	9	10	10	9	10	9
Velvetleaf	10	8	8	5	6	7	7	9	9	9	10	10	10	9	10	9	10	1
Wheat	2	5	1	0	2	0	0	2	0	0	0	4	5	0	0	0	9	0
Wild buckwheat	2	4	4	1	5	4	4	7	1	1	5	8	6	8	9	3	9	5
Wild oat	2	4	6	1	1	0	0	2	2	3	2	2	2	0	1	0	9	1

Table A	COMPOUND																	
Rate 100 g/ha	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	19	22	26
Preemergence																		
Barley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	9	0
Bedstraw	-	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	9	0
Blackgrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
Chickweed	0	0	2	0	0	0	0	0	0	1	0	0	0	7	9	0	9	0
Cocklebur	0	0	0	0	0	0	3	0	4	0	0	0	0	1	7	0	7	0
Corn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cotton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Crabgrass	2	0	0	0	0	0	1	2	0	0	0	0	2	0	1	0	10	0
Downy brome	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	9	0
Giant foxtail	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Lambsquarter	6	8	8	7	7	0	0	9	0	4	6	0	8	10	10	8	10	4
Morningglory	0	0	0	0	0	-	0	0	0	0	0	0	0	6	2	0	8	0
Nutsedge	-	0	0	0	0	0	-	0	0	0	0	-	0	-	0	0	1	0
Rape	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8	0	2	0
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	0
Sorghum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
Soybean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
Sugar beet	0	0	0	0	0	0	0	0	0	0	0	0	2	10	10	0	10	0
Velvetleaf	0	0	0	0	0	0	0	6	3	0	0	0	3	9	10	4	10	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wild buckwheat	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6	0
Wild oat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Table A	COMPOUND		
Rate 50 g/ha	23	24	25
Postemergence			
Barley	7	8	8
Barnyardgrass	9	9	10
Bedstraw	8	7	9
Blackgrass	5	8	8
Chickweed	8	9	8
Cocklebur	9	10	9
Corn	2	7	8
Cotton	9	10	10
Crabgrass	4	9	9
Downy brome	5	7	8
Giant foxtail	7	8	9
Lambsquarter	9	9	9
Morningglory	9	9	9
Nutsedge	2	8	1
Rape	9	7	10
Rice	9	9	9
Sorghum	9	9	10
Soybean	9	9	8
Sugar beet	10	10	10
Velvetleaf	9	9	9
Wheat	7	9	9
Wild buckwheat	2	3	2
Wild oat	8	4	10

Table A	COMPOUND		
Rate 50 g/ha	23	24	25
Preemergence			
Barley	0	0	0
Barnyardgrass	3	3	2
Bedstraw	6	-	1
Blackgrass	1	1	0
Chickweed	7	9	7
Cocklebur	0	-	0
Corn	0	0	0
Cotton	0	0	0
Crabgrass	10	10	6
Downy brome	2	7	0
Giant foxtail	1	1	2
Lambsquarter	9	9	9
Morningglory	1	4	1
Nutsedge	-	0	-
Rape	3	4	7
Rice	0	3	2
Sorghum	0	2	0
Soybean	0	7	0
Sugar beet	10	10	3
Velvetleaf	8	8	1
Wheat	0	2	0
Wild buckwheat	0	1	0
Wild oat	2	3	0

TEST B

The compounds evaluated in this test were formulated in a non-phytotoxic solvent mixture which includes a surfactant and applied to the soil surface before plant seedlings emerged (preemergence application), to water that covered the soil surface (flood application), and to plants that were in the one-to-four leaf stage (postemergence application). A sandy loam soil was used for the preemergence and postemergence tests, while a silt loam soil was used in the flood test. Water depth was approximately 2.5 cm for the flood test and was maintained at this level for the duration of the test.

Plant species in the preemergence and postemergence tests consisted of barnyardgrass (*Echinochloa crus-galli*), barley (*Hordeum vulgare*), bedstraw (*Galium aparine*), blackgrass (*Alopecurus myosuroides*), chickweed (*Stellaria media*), cocklebur (*Xanthium strumarium*), corn (*Zea mays v.Pioneer 3394*), cotton (*Gossypium hirsutum*), crabgrass (*Digitaria sanguinalis*), downy brome (*Bromus tectorum*), giant *foxtail (Setaria faberii*), johnsongrass (*Sorghum halpense*), lambsquarters (*Chenopodium album*), morningglory (*Ipomoea hederacea*), pigweed (*Amaranthus retroflexus*), *rape (Brassica napus*), ryegrass (*Lolium multiflorum*), soybean (*Glycine max*), speedwell (*Veronica persica*), sugar beet (*Beta vulgaris*), velvetleaf (*Abutilon theophrasti*), wheat (*Triticum aestivum*), wild buckwheat (*Polygonum convolvulus*), and wild oat (*Avena fatua*). Additionally, two 10.3 cm pots each containing two plant of corn (*Zea mays*) of the varieties M17 and B73 were treated in addition to the normal compliment of crop species.

All plant species were planted one day before application of the compound for the preemergence portion of this test. Plantings of these species were adjusted to produce plants of appropriate size for the postemergence portion of the test. Plant species in the flood test consisted of rice (*Oryza sativa*), umbrella sedge (*Cyperus difformis*), duck salad (*Heteranthera limosa*), barnyardgrass2 (*Echinochloa crus-galli*) and Late watergrass (*Echinochloa oryzicola* grown to the 2 leaf stage for testing.

All plant species were grown using normal greenhouse practices. Visual evaluations of injury expressed on treated plants, when compared to untreated controls, were recorded approximately fourteen to twenty one days after application of the test compound. Plant response ratings, summarized in Table B, were recorded on a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash (-) response means no test result.

Table B	COMPOUND
Rate 500 g/ha	1
POSTEMERGENCE	
Barley Igri	0
Barnyard 2	65
Barnyardgrass	90
Bedstraw	80
Blackgrass	20
Chickweed	90
Cocklebur	70
Corn	0
Corn (B73)	-
Corn (M17)	-
Cotton	50
Crabgrass	90
Downy Brome	10
Duck salad	60
Giant foxtail	90
Italn. Rygrass	10
Johnsongrass	60
Lambsquarter	90
Morningglory	90
Rape	70
Redroot Pigweed	70
Rice Japonica	25
Soybean	40
Speedwell	70
Sugar beet	70
Umbrella sedge	80
Velvetleaf	90
Wheat	30
Wild buckwheat	50
Wild oat	50

Table B	COMPOUND
Rate 500 g/ha	1
PREEMERGENCE	
Barley Igri	0
Barnyardgrass	60
Bedstraw	50
Blackgrass	0
Chickweed	30
Cocklebur	0
Corn	0
Cotton	0
Crabgrass	80
Downy Brome	0
Giant foxtail	50
Italn. Rygrass	0
Johnsongrass	0
Lambsquarter	90
Morningglory	0
Rape	20
Redroot Pigweed	0
Soybean	0
Speedwell	60
Sugar beet	30
Velvetleaf	90
Wheat	0
Wild buckwheat	0
Wild oat	0

Table B	COMPOUND			
Rate 250 g/ha	1	5	6	26
POSTEMERGENCE				
Barley Igri	0	15	-	-
Barnyard 2	45	20	10	0
Barnyardgrass	80	95	-	-
Bedstraw	70	90	-	-
Blackgrass	20	15	-	-
Chickweed	80	90	-	-
Cocklebur	70	70	-	-
Corn	0	15	-	-
Corn (B73)	-	65	-	-
Corn (M17)	-	60	-	-
Cotton	50	50	-	-
Crabgrass	90	90	-	-
Downy Brome	0	15	-	-
Duck salad	50	20	0	0
Giant foxtail	80	80	-	-
Italn. Rygrass	0	0	-	-
Johnsongrass	60	50	-	-
Lambsquarter	90	90	-	-
Morningglory	80	40	-	-
Rape	60	50	-	-
Redroot Pigweed	70	90	-	-
Rice Japonica	10	0	0	0
Soybean	40	40	-	-
Speedwell	-	10	-	-
Sugar beet	70	90	-	-
Umbrella sedge	70	30	30	0
Velvetleaf	90	80	-	-
Wheat	20	10	-	-
Wild buckwheat	50	70	-	-
Wild oat	30	20	-	-

Table B	COMPOUND	
Rate 250 g/ha	1	5
PREEMERGENCE		
Barley Igri	0	0
Barnyardgrass	20	0
Bedstraw	0	0
Blackgrass	0	0
Chickweed	0	10
Cocklebur	0	20
Corn	0	0
Cotton	0	0
Crabgrass	60	35
Downy Brome	0	0
Giant foxtail	20	10
Italn. Rygrass	0	0
Johnsongrass	0	0
Lambsquarter	70	80
Morningglory	0	0
Rape	0	0
Redroot Pigweed	0	40
Soybean	0	0
Speedwell	50	10
Sugar beet	0	60
Velvetleaf	70	20
Wheat	0	0
Wild buckwheat	0	0
Wild oat	0	0

Table B	COMPOUND									
Rate 125 g/ha	1	5	6	12	13	14	15	22	23	26
POSTEMERGENCE										
Barley Igri	0	0	-	0	0	0	0	100	70	-
Barnyard 2	20	10	0	0	10	0	0	95	20	0
Barnyardgrass	70	90	-	90	90	80	90	100	90	-
Bedstraw	30	80	-	20	98	50	70	95	85	-
Blackgrass	10	10	-	0	10	10	0	95	60	-
Chickweed	70	80	-	10	40	60	95	100	100	-
Cocklebur	50	60	-	70	70	80	90	100	100	-
Corn	0	10	-	0	0	0	0	30	0	-
Corn (B73)	-	40	-	60	60	10	5	-	-	-
Corn (M17)	-	30	-	0	25	0	5	-	-	-
Cotton	40	40	-	70	90	30	90	100	90	-
Crabgrass	70	80	-	90	90	35	50	90	100	-
Downy Brome	0	10	-	0	98	0	0	-	50	-
Duck salad	40	0	0	50	40	50	70	80	90	0
Giant foxtail	70	50	-	75	70	40	50	90	100	-
Italn. Rygrass	0	0	-	0	0	0	30	85	70	-
Johnsongrass	30	30	-	50	50	0	70	100	100	-
Lambsquarter	70	90	-	90	90	90	100	100	100	-
Morningglory	80	40	-	70	80	90	90	100	90	-
Rape	30	20	-	30	0	90	100	-	100	-
Redroot Pigweed	70	90	-	70	70	90	95	100	100	-
Rice Japonica	0	0	0	10	0	0	10	95	30	0
Soybean	20	30	-	50	50	40	50	90	90	-
Speedwell	50	0	-	0	20	80	90	100	-	-
Sugar beet	30	80	-	20	-	90	90	100	-	-
Umbrella sedge	60	10	20	60	70	50	60	50	85	0
Velvetleaf	90	60	-	100	90	90	100	100	95	-
Wheat	0	0	-	0	0	0	0	100	80	-
Wild buckwheat	20	40	-	60	98	90	90	70	50	-
Wild oat	30	0	-	0	0	0	0	100	80	-

Table B	COMPOUND							
Rate 125 g/ha	1	5	12	13	14	15	22	23
PREEMERGENCE								
Barley Igri	0	0	0	0	10	10	0	0
Barnyardgrass	0	0	0	0	0	20	100	50
Bedstraw	0	0	-	20	30	35	100	50
Blackgrass	0	0	0	0	0	0	30	20
Chickweed	0	0	0	70	70	90	100	80
Cocklebur	0	0	0	0	0	30	90	30
Corn	0	0	0	0	0	0	0	0
Cotton	0	0	10	0	0	100	90	50
Crabgrass	35	0	70	60	0	30	100	100
Downy Brome	0	0	0	0	10	20	100	0
Giant foxtail	10	0	35	20	0	10	35	75
Italn. Rygrass	0	0	0	0	0	0	80	10
Johnsongrass	0	0	30	0	0	40	100	60
Lambsquarter	40	40	30	95	100	95	100	100
Morningglory	0	0	10	0	10	20	100	60
Rape	0	0	0	0	30	80	0	35
Redroot Pigweed	0	30	30	10	60	70	-	95
Soybean	0	0	0	0	0	10	80	30
Speedwell	50	0	70	70	90	100	100	100
Sugar beet	0	60	30	10	100	100	100	100
Velvetleaf	40	0	30	100	100	100	100	100
Wheat	0	0	0	0	15	0	0	0
Wild buckwheat	0	0	0	0	0	60	40	0
Wild oat	0	0	0	10	0	10	0	10

Table B	COMPOUND										
Rate 62 g/ha	1	5	6	12	13	14	15	22	23	24	26
POSTEMERGENCE											
Barley Igri	0	0	-	0	0	0	0	85	60	50	-
Barnyard 2	10	0	0	0	0	0	0	35	10	10	0
Barnyardgrass	60	80	-	70	90	50	70	100	90	100	-
Bedstraw	30	70	-	0	98	30	70	85	-	75	-
Blackgrass	10	10	-	0	0	0	0	95	50	70	-
Chickweed	60	70	-	0	30	60	90	100	100	90	-
Cocklebur	20	60	-	20	70	80	90	100	95	90	-
Corn	0	0	-	0	0	0	0	20	0	55	-
Corn (B73)	-	15	-	40	50	5	5	-	-	-	-
Corn (M17)	-	20	-	0	5	0	0	-	-	-	-
Cotton	0	30	-	30	30	20	80	100	90	95	-
Crabgrass	50	80	-	90	80	15	30	90	100	95	-
Downy Brome	0	0	-	0	0	0	0	95	40	60	-
Duck salad	10	0	-	20	0	30	40	70	80	90	0
Giant foxtail	40	40	-	50	50	0	30	65	100	90	-
Italn. Rygrass	0	0	-	0	0	0	0	60	50	60	-
Johnsongrass	10	20	-	-	30	0	50	100	100	90	-
Lambsquarter	30	80	-	80	90	90	95	100	90	95	-
Morningglory	40	30	-	30	40	90	90	100	90	90	-
Rape	20	0	-	0	0	70	90	-	100	100	-
Redroot Pigweed	50	80	-	50	30	90	90	100	90	90	-
Rice Japonica	0	0	0	0	0	0	0	95	20	30	0
Soybean	0	30	-	40	35	40	40	90	90	90	-
Speedwell	50	0	-	0	20	50	80	100	80	100	-
Sugar beet	0	70	-	0	-	90	90	100	-	90	-
Umbrella sedge	20	0	0	30	20	30	50	50	70	80	0
Velvetleaf	80	50	-	100	80	90	90	100	95	95	-
Wheat	0	0	-	0	0	0	0	90	70	70	-
Wild buckwheat	10	0	-	10	98	70	80	70	40	70	-
Wild oat	20	0	-	0	0	0	0	100	60	60	-

Table B	COMPOUND								
Rate 62 g/ha	1	5	12	13	14	15	22	23	24
PREEMERGENCE									
Barley Igri	0	0	0	0	10	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	70	20	50
Bedstraw	0	0	0	0	0	20	100	40	85
Blackgrass	0	0	0	0	0	0	30	0	20
Chickweed	0	0	0	-	20	70	100	80	100
Cocklebur	0	0	0	0	0	-	50	30	30
Corn	0	0	0	0	0	0	0	0	0
Cotton	0	0	0	0	0	50	90	30	30
Crabgrass	20	0	50	40	0	20	100	100	100
Downy Brome	0	0	0	0	0	0	100	0	25
Giant foxtail	0	0	25	0	0	0	15	60	70
Italn. Rygrass	0	0	0	0	0	0	70	10	10
Johnsongrass	0	0	20	0	0	10	50	60	60
Lambsquarter	40	20	30	10	100	95	100	100	100
Morningglory	0	0	0	0	0	10	80	50	70
Rape	0	0	0	0	0	30	0	0	10
Redroot Pigweed	0	20	20	0	30	40	-	90	100
Soybean	0	0	0	0	0	0	70	0	30
Speedwell	-	0	50	-	80	90	100	60	100
Sugar beet	0	20	20	0	100	100	100	100	100
Velvetleaf	20	0	20	30	40	100	100	100	100
Wheat	0	0	0	0	10	0	0	0	20
Wild buckwheat	0	0	0	0	0	30	30	0	10
Wild oat	0	0	0	0	0	0	0	0	10

Table B	COMPOUND											
Rate 31 g/ha	1	5	6	12	13	14	15	22	23	24	25	26
POSTEMERGENCE												
Barley Igri	-	0	-	0	0	0	0	75	50	40	0	-
Barnyard 2	0	0	0	0	0	0	0	0	0	10	30	0
Barnyardgrass	-	70	-	60	70	20	50	100	90	95	90	-
Bedstraw	-	30	-	0	-	10	50	80	60	75	60	-
Blackgrass	-	0	-	0	0	0	0	75	30	70	30	-
Chickweed	-	50	-	0	20	60	80	100	-	90	90	-
Cocklebur	-	40	-	-	20	80	85	100	95	90	90	-
Corn	-	0	-	0	0	0	0	0	0	40	30	-
Corn (B73)	-	10	-	10	5	5	5	-	-	-	30	-
Corn (M17)	-	10	-	0	0	0	0	-	-	-	30	-
Cotton	-	20	-	10	20	0	50	95	90	90	100	-
Crabgrass	-	60	-	80	70	10	30	90	90	90	90	-
Downy Brome	-	0	-	0	0	0	0	75	30	60	0	-
Duck salad	0	0	0	0	0	0	10	45	60	70	20	0
Giant foxtail	-	40	-	35	30	0	20	50	90	80	90	-
Italn. Rygrass	-	0	-	0	0	0	0	60	40	50	0	-
Johnsongrass	-	15	-	-	20	0	30	80	100	90	80	-
Lambsquarter	-	70	-	80	80	90	90	100	90	95	90	-
Morningglory	-	30	-	20	40	70	90	90	90	90	90	-
Rape	-	0	-	0	0	70	80	-	80	90	90	-
Redroot Pigweed	-	80	-	30	20	80	90	95	90	90	100	-
Rice Japonica	0	0	0	0	0	0	0	15	10	20	0	0
Soybean	-	15	-	20	30	35	35	90	80	90	70	-
Speedwell	-	0	-	0	0	50	80	100	80	90	100	-
Sugar beet	-	70	-	0	98	80	80	100	-	90	90	-
Umbrella sedge	0	0	0	10	0	0	30	50	50	70	20	0
Velvetleaf	-	30	-	90	80	80	90	100	90	90	80	-
Wheat	-	0	-	0	0	0	0	85	50	60	20	-
Wild buckwheat	-	0	-	0	98	70	50	60	30	70	10	-
Wild oat	-	0	-	0	0	0	0	70	40	40	90	-

Table B	COMPOUND								
Rate 31 g/ha	5	12	13	14	15	22	23	24	25
PREEMERGENCE									
Barley Igri	0	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	15	0	10	0
Bedstraw	0	0	0	0	0	60	30	70	30
Blackgrass	0	0	0	0	0	20	0	10	0
Chickweed	0	0	10	20	70	100	40	95	50
Cocklebur	0	0	0	0	-	10	10	0	-
Corn	0	0	0	0	0	0	0	0	0
Cotton	0	-	0	0	30	60	30	20	0
Crabgrass	0	30	10	0	10	100	-	100	40
Downy Brome	0	0	0	0	0	0	0	0	20
Giant foxtail	0	10	0	0	0	0	0	30	10
Italn. Rygrass	0	0	0	0	0	40	0	0	0
Johnsongrass	0	10	0	0	0	20	30	40	0
Lambsquarter	0	20	0	100	95	100	100	100	100
Morningglory	0	0	0	0	0	30	50	60	0
Rape	0	0	0	0	20	-	0	0	0
Redroot Pigweed	10	10	0	0	20	-	70	85	0
Soybean	0	0	0	0	0	60	0	30	0
Speedwell	0	-	60	-	90	100	60	100	20
Sugar beet	20	10	0	70	100	100	70	90	70
Velvetleaf	0	10	10	0	40	100	70	90	0
Wheat	0	0	0	10	0	0	0	0	0
Wild buckwheat	0	0	0	0	0	0	0	0	0
Wild oat	0	0	0	0	0	0	0	0	0

Table B	COMPOUND							
Rate 16 g/ha	12	13	14	15	22	23	24	25
POSTEMERGENCE								
Barley Igri	0	0	0	0	45	30	30	0
Barnyard 2	0	0	0	0	0	0	0	20
Barnyardgrass	40	20	0	30	90	90	95	90
Bedstraw	0	-	10	40	75	60	40	60
Blackgrass	0	0	0	0	70	30	35	20
Chickweed	0	0	50	60	100	80	80	80
Cocklebur	10	0	70	80	95	90	90	80
Corn	0	0	0	0	0	0	25	10
Corn (B73)	0	0	5	5	-	-	-	20
Corn (M17)	0	0	0	0	-	-	-	10
Cotton	10	0	0	30	95	80	85	50
Crabgrass	60	70	0	20	80	80	85	90
Downy Brome	0	0	0	0	70	30	30	0
Duck salad	0	0	0	0	25	10	50	0
Giant foxtail	30	20	0	0	40	80	60	85
Italn. Rygrass	0	0	0	0	40	30	50	0
Johnsongrass	-	20	0	30	70	80	80	60
Lambsquarter	50	60	80	80	100	85	90	70
Morningglory	10	20	50	80	90	90	90	90
Rape	0	0	40	70	-	60	50	90
Redroot Pigweed	0	20	70	80	90	90	80	80
Rice Japonica	0	0	0	0	0	0	10	0
Soybean	20	20	30	20	90	80	90	60
Speedwell	0	0	-	50	95	50	70	70
Sugar beet	0	98	80	80	100	-	90	80
Umbrella sedge	0	0	0	10	15	35	60	0
Velvetleaf	80	80	80	90	100	90	90	70
Wheat	0	0	0	0	70	35	50	10
Wild buckwheat	0	98	40	50	45	20	20	0
Wild oat	0	0	0	0	60	20	30	60

Table B	COMPOUND							
Rate 16 g/ha	12	13	14	15	22	23	24	25
PREEMERGENCE								
Barley Igri	0	0	0	0	0	0	0	0
Barnyardgrass	0	0	0	0	0	0	0	0
Bedstraw	0	0	0	0	20	20	50	0
Blackgrass	0	0	0	0	20	0	0	0
Chickweed	0	10	0	60	100	20	90	40
Cocklebur	0	0	0	-	0	0	0	0
Corn	0	0	0	0	0	0	0	0
Cotton	0	0	0	20	30	10	-	0
Crabgrass	20	0	0	10	100	80	70	40
Downy Brome	0	0	0	0	0	0	0	0
Giant foxtail	0	0	0	0	0	0	0	-
Italn. Rygrass	0	0	0	0	0	0	0	0
Johnsongrass	10	0	0	0	10	0	10	0
Lambsquarter	0	0	80	95	100	30	95	60
Morningglory	0	0	0	0	30	-	50	0
Rape	0	0	0	0	-	0	0	0
Redroot Pigweed	0	0	0	10	-	50	70	0
Soybean	0	0	0	0	40	0	0	0
Speedwell	30	60	80	90	100	0	90	20
Sugar beet	0	0	30	90	100	50	0	40
Velvetleaf	0	0	0	30	100	60	70	0
Wheat	0	0	0	0	0	0	0	0
Wild buckwheat	0	0	0	0	0	0	0	0
Wild oat	0	0	0	0	0	0	0	0

Table B	COMPOUND	
Rate 8 g/ha	24	25
POSTEMERGENCE		
Barley Igri	30	0
Barnyard 2	0	0
Barnyardgrass	90	85
Bedstraw	-	40
Blackgrass	35	20
Chickweed	70	80
Cocklebur	90	80
Corn	15	0
Corn (B73)	-	10
Corn (M17)	-	0
Cotton	70	40
Crabgrass	75	80
Downy Brome	30	0
Duck salad	20	0
Giant foxtail	40	75
Italn. Rygrass	40	0
Johnsongrass	70	60
Lambsquarter	60	70
Morningglory	85	90
Rape	40	80
Redroot Pigweed	60	60
Rice Japonica	10	0
Soybean	90	60
Speedwell	70	70
Sugar beet	90	70
Umbrella sedge	40	0
Velvetleaf	75	40
Wheat	35	0
Wild buckwheat	10	0
Wild oat	20	40

Table B	COMPOUND	
Rate 8 g/ha	24	25
PREEMERGENCE		
Barley Igri	0	0
Barnyardgrass	0	0
Bedstraw	0	0
Blackgrass	0	0
Chickweed	80	0
Cocklebur	0	0
Corn	0	0
Cotton	20	0
Crabgrass	50	20
Downy Brome	0	0
Giant foxtail	0	0
Italn. Rygrass	0	0
Johnsongrass	0	0
Lambsquarter	95	40
Morningglory	10	0
Rape	0	0
Redroot Pigweed	70	0
Soybean	0	0
Speedwell	90	0
Sugar beet	0	0
Velvetleaf	40	0
Wheat	0	0
Wild buckwheat	0	0
Wild oat	0	0

Table B	COMPOUND
Rate 4 g/ha	25
POSTEMERGENCE	
Barley Igri	0
Barnyard 2	0
Barnyardgrass	80
Bedstraw	30
Blackgrass	10
Chickweed	70
Cocklebur	75
Corn	0
Corn (B73)	10
Corn (M17)	0
Cotton	30
Crabgrass	70
Downy Brome	0
Duck salad	0
Giant foxtail	60
Italn. Rygrass	0
Johnsongrass	30
Lambsquarter	65
Morningglory	70
Rape	80
Redroot Pigweed	60
Rice Japonica	0
Soybean	40
Speedwell	60
Sugar beet	60
Umbrella sedge	0
Velvetleaf	30
Wheat	0
Wild buckwheat	0
Wild oat	10

Table B	COMPOUND
Rate 4 g/ha	25
PREEMERGENCE	
Barley Igri	0
Barnyardgrass	0
Bedstraw	0
Blackgrass	0
Chickweed	0
Cocklebur	0
Corn	0
Cotton	0
Crabgrass	0
Downy Brome	0
Giant foxtail	0
Italn. Rygrass	0
Johnsongrass	0
Lambsquarter	30
Morningglory	0
Rape	0
Redroot Pigweed	0
Soybean	0
Speedwell	0
Sugar beet	0
Velvetleaf	0
Wheat	0
Wild buckwheat	0
Wild oat	0

TEST C

Plastic pots were partially filled with silt loam soil. The soil was then saturated with water. Indica Rice (*Oryza sativa*) seed or seedlings at the 2.0 to 3.5 leaf stage; seeds, tubers or plant parts selected from arrowhead (*Sagittaria rigida*), barnyardgrass (*Echinochloa crus-galli*), ducksalad (*Heteranthera limosa*), early watergrass (*Echinochloa oryzoides*), junglerice (*Echinochloa colonum*), late watergrass (*Echinochloa oryzicola*), redstem (*Ammania species*), rice flatsedge (*Cyperus iria*), smallflower flatsedge (*Cyperus difformis*) and tighthead sprangletop (*Leptochloa fasicularis*), were planted into this soil. Plantings and waterings of these crops and weed species were adjusted to produce plants of appropriate size for the test. At the two leaf stage, water levels were raised to 3 cm above the soil surface and maintained at this level throughout the test. Chemical treatments were formulated in a non-phytotoxic solvent mixture which includes a surfactant and applied directly to the paddy water, by pipette, or to the plant foliage, by an air-pressure assisted, calibrated belt-conveyer spray system.

Treated plants and controls were maintained in a greenhouse for approximately 21 days, after which all species were compared to controls and visually evaluated. Plant response ratings, summarized in Table C, are reported on a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash (-) response means no test result.

Table C	COMPOUND	
Rate 375 g/ha	13	15
PD/TA		
ducksalad	85	98
early watergras	-	20
junglerice	15	20
late watergrass	0	0
redstem	100	100
rice flatsedge	80	80
smallflower fla	80	95
tighthead spran	95	20
2 LF barnyard g	30	15
2 LF direct see	10	15
2 LF transp. in	15	15

Table C	COMPOUND	
Rate 250 g/ha	13	15
PD/TA		
ducksalad	70	95
early watergras	20	20
junglerice	10	25
late watergrass	0	-
redstem	95	100
rice flatsedge	75	45
smallflower fla	75	95
tighthead spran	95	30
2 LF barnyard g	15	15
2 LF direct see	0	15
2 LF transp. in	0	15

Table C	COMPOUND			
Rate 125 g/ha	13	15	23	25
PD/TA				
ducksalad	65	85	100	85
early watergras	0	15	-	25
junglerice	0	40	75	10
late watergrass	0	20	0	10
redstem	95	98	98	98
rice flatsedge	70	35	60	65
smallflower fla	70	85	100	95
tighthead spran	90	25	98	75
2 LF barnyard g	0	15	0	10
2 LF direct see	0	15	100	25
2 LF transp. in	10	10	60	30

Table C	COMPOUND			
Rate 64 g/ha	13	15	23	25
PD/TA				
ducksalad	75	75	98	85
early watergras	0	15	-	15
junglerice	0	10	30	0
late watergrass	0	-	0	10
redstem	85	85	60	90
rice flatsedge	75	35	20	40
smallflower fla	75	75	100	85
tighthead spran	80	40	95	65
2 LF barnyard g	0	15	0	0
2 LF direct see	0	15	10	10
2 LF transp. in	0	0	10	25

Table C	COMPOUND			
Rate 32 g/ha	13	15	23	25
PD/TA				
ducksalad	65	0	80	20
early watergras	0	0	-	0
junglerice	0	0	15	0
late watergrass	0	0	0	0
redstem	20	0	30	20
rice flatsedge	60	35	10	40
smallflower fla	60	0	100	10
tighthead spran	80	40	95	75
2 LF barnyard g	0	0	0	0
2 LF direct see	0	10	0	15
2 LF transp. in	0	0	0	20

Table C	COMPOUND	
Rate 16 g/ha	23	25
PD/TA		
ducksalad	95	10
early watergras	-	0
junglerice	25	0
late watergrass	0	0
redstem	30	20
rice flatsedge	5	40
smallflower fla	95	10
tighthead spran	95	60
2 LF barnyard g	0	0
2 LF direct see	0	10
2 LF transp. in	0	10

Table C		COMPOUND
Rate	8 g/ha	23	25
PD/TA			
ducksalad		0	0
early watergras		-	0
junglerice		0	0
late watergrass		0	0
redstem		0	20
rice flatsedge		0	0
smallflower fla		10	0
tighthead spran		40	0
2 LF barnyard g		0	0
2 LF direct see		0	10
2 LF transp. in		0	0

TEST D

Seeds, tubers, or plant parts of alexandergrass (*Brachiaria plantaginea*), bermudagrass (*Cynodon dactylon*), broadleaf signalgrass (*Brachiaria platyphylla*), common purslane (*Portulaca oleracea*), common ragweed (*Ambrosia elatior*), cotton (*Gossypium hirsutum*), dallisgrass (*Paspalum dilatatum*), goosegrass (*Eleusine indica*), guineagrass (*Panicum maximum*), itchgrass (*Rottboellia exaltata*), johnson grass (*Sorghum halepense*), large crabgrass (*Digitaria sanguinalis*), peanuts (*Arachis hypogaea*), pitted morningglory (*Ipomoea lacunosa*), purple nutsedge (*Cyperus rotundus*), sandbur (*Cenchrus echinatus*), sourgrass (*Trichachne insularis*), and surinam grass (*Brachiaria decumbens*) were planted into greenhouse pots of flats containing greenhouse planting medium. Plant species were grown in separate pots or individual compartments. Preemergence applications were made within one day of planting the seed or plant part. Postemergence applications were applied when the plants were in the two to four leaf stage (three to twenty cm).

Test chemicals were formulated in a non-phytotoxic solvent mixture which included a surfactant and applied preemergence and postemergence to the plants. Untreated control plants and treated plants were placed in the greenhouse and visually evaluated for injury 13 to 21 days after herbicide application. Plant response ratings, summarized in Table D, are based on a 0 to 100 scale where 0 is no injury and 100 is complete control. A dash (-) response means no test result.

Table D	COMPOUND		
Rate 250 g/ha	22	23	25
POSTEMERGENCE			
Alexandergrass	80	75	95
Bermudagrass	80	60	80
Brdlf Sgnlgrass	90	95	100
Cmn Purslane	80	60	75
Cmn Ragweed	50	-	60
Cotton	90	40	-
Dallisgrass	85	75	35
Goosegrass	80	50	95
Guineagrass	80	90	75
Itchgrass	10	-	35
Johnson grass	90	95	100
Large Crabgrass	65	100	25
Peanuts	65	-	90
Pit Morninglory	80	90	30
Purple Nutsedge	75	50	20
Sandbur	60	75	20
Sourgrass	80	50	75
Surinam grass	80	75	90

Table D	COMPOUND		
Rate 250 g/ha	22	23	25
PREEMERGENCE			
Alexandergrass	100	100	100
Bermudagrass	100	100	100
Brdlf Sgnlgrass	100	100	10
Cmn Purslane	100	100	100
Cmn Ragweed	-	-	100
Cotton	100	40	10
Dallisgrass	100	98	70
Goosegrass	100	-	100
Guineagrass	100	100	50
Itchgrass	40	-	5
Johnson grass	98	100	75
Large Crabgrass	100	100	100
Peanuts	50	20	55
Pit Morninglory	95	100	10
Purple Nutsedge	75	0	0
Sandbur	98	80	45
Sourgrass	100	100	100
Surinam grass	100	100	98

Table D	COMPOUND		
Rate 125 g/ha	22	23	25
POSTEMERGENCE			
Alexandergrass	80	75	95
Bermudagrass	85	60	85
Brdlf Sgnlgrass	80	98	100
Cmn Purslane	70	30	75
Cmn Ragweed	50	-	-
Cotton	95	35	0
Dallisgrass	85	75	0
Goosegrass	85	35	-
Guineagrass	80	95	75
Itchgrass	5	35	0
Johnson grass	80	90	100
Large Crabgrass	70	100	-
Peanuts	65	50	90
Pit Morninglory	80	90	30
Purple Nutsedge	75	30	10
Sandbur	40	75	20
Sourgrass	80	60	20
Surinam grass	90	75	90

Table D	COMPOUND		
Rate 125 g/ha	22	23	25
PREEMERGENCE			
Alexandergrass	100	90	35
Bermudagrass	98	100	100
Brdlf Sgnlgrass	98	95	0
Cmn Purslane	60	100	100
Cmn Ragweed	-	-	100
Cotton	65	10	10
Dallisgrass	100	98	0
Goosegrass	100	-	100
Guineagrass	98	98	40
Itchgrass	35	-	5
Johnson grass	65	100	10
Large Crabgrass	100	100	100
Peanuts	-	-	10
Pit Morninglory	80	90	10
Purple Nutsedge	-	0	0
Sandbur	98	95	0
Sourgrass	100	100	100
Surinam grass	100	90	45

Table D	COMPOUND		
Rate 64 g/ha	22	23	25
POSTEMERGENCE			
Alexandergrass	80	65	100
Bermudagrass	75	50	75
Brdlf Sgnlgrass	95	95	80
Cmn Purslane	65	30	75
Cmn Ragweed	-	-	-
Cotton	90	35	0
Dallisgrass	85	75	0
Goosegrass	70	35	90
Guineagrass	75	80	35
Itchgrass	0	0	0
Johnson grass	80	80	100
Large Crabgrass	60	50	0
Peanuts	35	65	75
Pit Morninglory	75	90	30
Purple Nutsedge	75	20	10
Sandbur	20	0	20
Sourgrass	70	40	20
Surinam grass	80	65	-

Table D	COMPOUND		
Rate 64 g/ha	22	23	25
PREEMERGENCE			
Alexandergrass	40	0	0
Bermudagrass	100	100	75
Brdlf Sgnlgrass	95	0	0
Cmn Purslane	40	65	100
Cmn Ragweed	-	-	98
Cotton	25	0	0
Dallisgrass	98	50	0
Goosegrass	-	-	100
Guineagrass	65	35	0
Itchgrass	0	0	5
Johnson grass	-	10	0
Large Crabgrass	100	80	100
Peanuts	100	0	5
Pit Morninglory	65	75	0
Purple Nutsedge	20	0	0
Sandbur	30	0	0
Sourgrass	100	98	98
Surinam grass	98	35	0

Table D	COMPOUND	
Rate 32 g/ha	22	25
POSTEMERGENCE		
Alexandergrass	40	90
Bermudagrass	65	50
Brdlf Sgnlgrass	80	35
Cmn Purslane	30	75
Cmn Ragweed	-	-
Cotton	75	0
Dallisgrass	70	0
Goosegrass	40	90
Guineagrass	65	20
Itchgrass	0	-
Johnson grass	75	100
Large Crabgrass	65	0
Peanuts	35	50
Pit Morninglory	75	20
Purple Nutsedge	65	0
Sandbur	20	10
Sourgrass	60	-
Surinam grass	65	75

Table D	COMPOUND	
Rate 32 g/ha	22	25
PREEMERGENCE		
Alexandergrass	0	0
Bermudagrass	50	0
Brdlf Sgnlgrass	0	0
Cmn Purslane	20	70
Cmn Ragweed	-	10
Cotton	25	0
Dallisgrass	60	0
Goosegrass	-	40
Guineagrass	10	5
Itchgrass	0	0
Johnson grass	90	0
Large Crabgrass	65	40
Peanuts	100	5
Pit Morninglory	65	100
Purple Nutsedge	-	0
Sandbur	0	0
Sourgrass	98	85
Surinam grass	0	0

Table D	COMPOUND
Rate 16 g/ha	22
POSTEMERGENCE	
Alexandergrass	35
Bermudagrass	50
Brdlf Sgnlgrass	40
Cmn Purslane	30
Cmn Ragweed	-
Cotton	70
Dallisgrass	35
Goosegrass	30
Guineagrass	35
Itchgrass	20
Johnson grass	35
Large Crabgrass	50
Peanuts	0
Pit Morninglory	65
Purple Nutsedge	5
Sandbur	0
Sourgrass	35
Surinam grass	35

Table D	COMPOUND
Rate 16 g/ha	22
PREEMERGENCE	
Alexandergrass	0
Bermudagrass	50
Brdlf Sgnlgrass	0
Cmn Purslane	0
Cmn Ragweed	-
Cotton	0
Dallisgrass	50
Goosegrass	-
Guineagrass	0
Itchgrass	0
Johnson grass	30
Large Crabgrass	20
Peanuts	0
Pit Morninglory	0
Purple Nutsedge	0
Sandbur	0
Sourgrass	90
Surinam grass	0

Table D	COMPOUND
Rate 8 g/ha	22
POSTEMERGENCE	
Alexandergrass	35
Bermudagrass	40
Brdlf Sgnlgrass	70
Cmn Purslane	35
Cmn Ragweed	-
Cotton	0
Dallisgrass	20
Goosegrass	30
Guineagrass	35
Itchgrass	0
Johnson grass	35
Large Crabgrass	35
Peanuts	0
Pit Morninglory	35
Purple Nutsedge	0
Sandbur	0
Sourgrass	35
Surinam grass	35

Table D	COMPOUND
Rate 8 g/ha	22
PREEMERGENCE	
Alexandergrass	0
Bermudagrass	0
Brdlf Sgnlgrass	0
Cmn Purslane	0
Cmn Ragweed	-
Cotton	0
Dallisgrass	50
Goosegrass	-
Guineagrass	0
Itchgrass	0
Johnson grass	-
Large Crabgrass	0
Peanuts	0
Pit Morninglory	0
Purple Nutsedge	0
Sandbur	0
Sourgrass	90
Surinam grass	0

TEST E

Seeds of barnyardgrass (*Echinochloa crus-galli*), bindweed (*Concolculus arvensis*), black nightshade (*Solanum ptycanthum dunal*), cassia (*Cassia obtusifolia*), cocklebur (*Xanthium strumarium*), common ragweed (*Ambrosia artemisiifolia*), corn (*Zea mays v. Pioneer* 3394), corn2 (*Zea mays v. IMR Ciba 4393*), cotton (*Gossypium hirsutam*), crabgrass (*Digitaria spp.*), fall panicum (*Panicum dichotomiflorum*), giant foxtail (*Setaria faberii*), green foxtail (*Setaria viridis*), jimsonweed (*Datura stramonium*), johnsongrass (*Sorghum halepense*), lambsquarter (*Chenopodium album*), morningglory (*Ipomoea spp.*), pigweed (*Amaranthus retroflexus*), prickly sida (*Sida spinosa*), shattercane (*Sorghum vulgare*), signalgrass (*Brachiaria platyphylla*), smartweed (*Polygonum pensylvanicum*), soybean (*Glycine max v. Williams 95*) and soybean2 (*Glycine max v. Asgrow 3304*), sunflower (*Helianthus annuus*), velvetleaf (*Abutilon theophrasti*), wild proso (*Pancium miliaceum*), woolly cupgrass (*Eriochloa villosa*), yellow foxtail (*Setaria lutescens*) and purple nutsedge (*Cyperus rotundus*) tubers were planted into a sandy loam or clay loam soil. These crops and weeds were grown in the greenhouse until the plants ranged in height from two to eighteen cm (one to four leaf stage), then treated postemergence with the test chemicals formulated in a non-phytotoxic solvent mixture which included a surfactant. Pots treated in this fashion were placed in the greenhouse and maintained according to routine greenhouse procedures.

Treated plants and untreated controls were maintained in the greenhouse approximately 14-21 days after application of the test compound. Visual evaluations of plant injury responses were then recorded. Plant response ratings, summarized in Table E, are reported on a 0 to 100 scale where 0 is no effect and 100 is complete control.

Table E	COMPOUND
Rate 140 g/ha	23
POSTEMERGENCE	
Barnyardgrass	80
Bindweed	70
Blk Nightshade	100
Cassia	55
Cocklebur	100
Corn	15
Corn2	20
Cotton	70
Crabgrass	70
Fall Panicum	90
Giant Foxtail	65
Green Foxtail	55
Jimsonweed	100
Johnson Grass	85
Lambsquarter	90
Morningglory	90
Nutsedge	25
Pigweed	75
Prickly Sida	50
Ragweed	100
Shattercane	80
Signalgrass	85
Smartweed	100
Soybean	85
Soybean2	80
Sunflower	100
Velvetleaf	85
Wild Proso	85
Woolly cupgrass	65
Yellow Foxtail	65

Table E	COMPOUND
Rate 70 g/ha	23
POSTEMERGENCE	
Barnyardgrass	100
Bindweed	60
Blk Nightshade	100
Cassia	50
Cocklebur	100
Corn	10
Corn2	15
Cotton	60
Crabgrass	60
Fall Panicum	80
Giant Foxtail	60
Green Foxtail	55
Jimsonweed	85
Johnson Grass	85
Lambsquarter	85
Morningglory	85
Nutsedge	0
Pigweed	70
Prickly Sida	30
Ragweed	100
Shattercane	70
Signalgrass	80
Smartweed	100
Soybean	85
Soybean2	80
Sunflower	100
Velvetleaf	75
Wild Proso	85
Woolly cupgrass	60
Yellow Foxtail	55

Table E	
COMPOUND	
Rate 35 g/ha	23
POSTEMERGENCE	
Barnyardgrass	75
Bindweed	50
Blk Nightshade	100
Cassia	45
Cocklebur	100
Corn	0
Corn2	15
Cotton	60
Crabgrass	60
Fall Panicum	70
Giant Foxtail	55
Green Foxtail	40
Jimsonweed	80
Johnson Grass	80
Lambsquarter	85
Morningglory	85
Nutsedge	0
Pigweed	60
Prickly Sida	20
Ragweed	85
Shattercane	50
Signalgrass	80
Smartweed	100
Soybean	80
Soybean2	80
Sunflower	85
Velvetleaf	70
Wild Proso	75
Woolly cupgrass	55
Yellow Foxtail	50

Table E	
COMPOUND	
Rate 17 g/ha	23
POSTEMERGENCE	
Barnyardgrass	35
Bindweed	50
Blk Nightshade	100
Cassia	15
Cocklebur	75
Corn	0
Corn2	15
Cotton	55
Crabgrass	55
Fall Panicum	65
Giant Foxtail	30
Green Foxtail	20
Jimsonweed	70
Johnson Grass	80
Lambsquarter	80
Morningglory	75
Nutsedge	0
Pigweed	60
Prickly Sida	15
Ragweed	80
Shattercane	30
Signalgrass	75
Smartweed	75
Soybean	75
Soybean2	80
Sunflower	70
Velvetleaf	60
Wild Proso	65
Woolly cupgrass	45
Yellow Foxtail	0

Table E	
COMPOUND	
Rate 8 g/ha	23
POSTEMERGENCE	
Barnyardgrass	20
Bindweed	50
Blk Nightshade	65
Cassia	10
Cocklebur	45
Corn	0
Corn2	0
Cotton	55
Crabgrass	55
Fall Panicum	55
Giant Foxtail	25
Green Foxtail	0
Jimsonweed	45
Johnson Grass	55
Lambsquarter	75
Morningglory	60
Nutsedge	0
Pigweed	15
Prickly Sida	15
Ragweed	65
Shattercane	0
Signalgrass	65
Smartweed	60
Soybean	65
Soybean2	75
Sunflower	55
Velvetleaf	55
Wild Proso	60
Woolly cupgrass	40
Yellow Foxtail	0

TEST F

Compounds evaluated in this test were formulated in a non-phytotoxic solvent mixture which included a surfactant and applied to plants that were grown for various periods of time before treatment (postemergence application). A mixture of sandy loam soil and greenhouse potting mix in a 60:40 ratio was used for the postemergence test.

Plantings of these crops and weed species were adjusted to produce plants of appropriate size for the postemergence test. All plant species were grown using normal greenhouse practices. Crop and weed species include arrowleaf sida (*Sida rhombifolia*), barnyardgrass (*Echinochloa crus-galli*), cocklebur (*Xanthium strumarium*), common lambsquarters (*Chenopodium album*), corn (*Zea mays*), cotton (*Gossypium hirsutum*), eastern black nightshade (*Solanum ptycanthum*), fall panicum (*Panicum dichotomiflorum*), field bindweed (*Convolvulus arvensis*), Florida beggarweed (*Desmodium purpureum*), giant foxtail (*Setaria faberii*), hairy beggarticks (*Bidens pilosa*), ivyleaf morningglory (*Ipomoea hederacea*), johnsongrass (*Sorghum halepense*), ladysthumb (*Polygonum persicaria*), large crabgrass (*Digitaria sanguinalis*), purple nutsedge (*Cyperus rotundus*), redroot pigweed (*Amaranthus retroflexus*), soybean (*Glycine max*), surinam grass (*Brachiaria decumbens*), velvetleaf (*Abutilon theophrasti*) and wild poinsettia (*Euphorbia heterophylla*).

Treated plants and untreated controls were maintained in a greenhouse for approximately 14 to 21 days, after which all treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table F, were based upon a 0 to 100 scale where 0 was no effect and 100 was complete control. A dash response (-) means no test result.

Table F		COMPOUND	
Rate 140 g/ha	15	22	23
POSTEMERGENCE			
Arrowleaf Sida	90	100	90
Barnyardgrass	70	100	95
Cocklebur	90	85	95
Common Ragweed	100	100	95
Corn	0	40	5
Cotton	100	100	85
Estrn Blknight	100	100	100
Fall Panicum	80	90	95
Field Bindweed	80	85	90
Fl Beggarweed	-	100	95
Giant Foxtail	0	95	95
Hairy Beggartic	80	60	85
Ivyleaw Mrnglry	95	100	90
Johnsongrass	0	100	95
Ladysthumb	100	100	100
Lambsquarters	100	85	90
Large Crabgrass	30	100	95
Purple Nutsedge	90	80	80
Redroot Pigweed	100	100	95
Soybean	50	100	90
Surinam Grass	20	90	90
Velvetleaf	100	100	90
Wild Poinsettia	100	100	85

Table F		COMPOUND	
Rate 70 g/ha	15	22	23
POSTEMERGENCE			
Arrowleaf Sida	80	90	90
Barnyardgrass	30	100	95
Cocklebur	85	85	95
Common Ragweed	90	100	95
Corn	0	20	5
Cotton	100	90	80
Estrn Blknight	100	100	100
Fall Panicum	70	85	95
Field Bindweed	80	65	90
Fl Beggarweed	-	100	95
Giant Foxtail	0	80	95
Hairy Beggartic	60	60	80
Ivyleaw Mrnglry	90	90	80
Johnsongrass	0	85	90
Ladysthumb	80	100	100
Lambsquarters	100	80	90
Large Crabgrass	0	100	90
Purple Nutsedge	5	75	20
Redroot Pigweed	90	100	95
Soybean	50	100	90
Surinam Grass	0	85	90
Velvetleaf	100	100	80
Wild Poinsettia	90	90	85

Table F		COMPOUND	
Rate 35 g/ha	15	22	23
POSTEMERGENCE			
Arrowleaw Sida	80	60	70
Barnyardgrass	30	90	90
Cocklebur	80	85	95
Common Ragweed	80	100	90
Corn	0	15	0
Cotton	85	85	80
Estrn Blknight	100	100	100
Fall Panicum	50	80	90
Field Bindweed	80	60	85
Fl Beggarweed	-	100	80
Giant Foxtail	0	75	85
Hairy Beggartic	40	50	70
Ivyleaw Mrnglry	90	80	70
Johnsongrass	0	80	85
Ladysthumb	60	100	90
Lambsquarters	95	80	90
Large Crabgrass	0	90	90
Purple Nutsedge	0	60	0
Redroot Pigweed	90	100	90
Soybean	40	95	85
Surinam Grass	0	80	80
Velvetleaf	100	100	80
Wild Poinsettia	80	75	80

Table F		COMPOUND	
Rate 17 g/ha	15	22	23
POSTEMERGENCE			
Arrowleaw Sida	10	55	0
Barnyardgrass	0	85	80
Cocklebur	80	80	90
Common Ragweed	70	85	90
Corn	0	15	0
Cotton	60	80	70
Estrn Blknight	100	90	90
Fall Panicum	40	75	80
Field Bindweed	80	50	85
Fl Beggarweed	-	100	60
Giant Foxtail	0	65	50
Hairy Beggartic	40	45	60
Ivyleaw Mrnglry	85	75	60
Johnsongrass	0	70	50
Ladysthumb	-	100	90
Lambsquarters	95	75	85
Large Crabgrass	0	85	70
Purple Nutsedge	0	45	0
Redroot Pigweed	80	90	85
Soybean	40	85	85
Surinam Grass	0	75	60
Velvetleaf	100	100	70
Wild Poinsettia	80	70	80

Table F	COMPOUND		
Rate 8 g/ha	15	22	23
POSTEMERGENCE			
Arrowleaw Sida	0	10	0
Barnyardgrass	0	75	40
Cocklebur	80	80	80
Common Ragweed	70	70	90
Corn	0	10	0
Cotton	60	70	55
Estrn Blknight	100	90	90
Fall Panicum	40	70	60
Field Bindweed	50	30	70
Fl Beggarweed	-	80	50
Giant Foxtail	0	50	40
Hairy Beggartic	20	40	50
Ivyleaw Mrnglry	85	65	60
Johnsongrass	0	60	10
Ladysthumb	30	90	80
Lambsquarters	90	65	80
Large Crabgrass	0	65	60
Purple Nutsedge	0	35	0
Redroot Pigweed	80	85	85
Soybean	20	80	80
Surinam Grass	0	70	30
Velvetleaf	100	75	50
Wild Poinsettia	80	65	80

TEST G

Compounds evaluated in this test were formulated in a non-phytotoxic solvent mixture which includes a surfactant and applied to plants that were grown for various periods of time before treatment (postemergence application). A mixture of sandy loam soil and greenhouse potting mix in a 60:40 ratio was used for the postemergence test. Test compounds were applied 13 days after the last postemergence planting.

Plantings of these crops and weed species were adjusted to produce plants of appropriate size for the postemergence test. All plant species were grown using normal greenhouse practices. Crop and weed species include bristly starbur (*Acanthospermun hispidum*) alexandergrass (*Brachiaria plantaginea*), american black nightshade (*Solanum americanum*), apple-of-Peru (*Nicandra physaloides*), arrowleaf sida (*Sida rhombifolia*), Brazilian sicklepod (*Cassia tora Brazilian*), Surinam grass (*Brachiaria decumbens*), capim-colchao (*Digitaria horizontalis*), Crist. soybean (*Glycine max v. Cristalina*), florida beggarweed (*Desmodium purpureum*), hairy beggarticks (*Bidens pilosa*), slender amaranth (*Amaranthus viridis*), southern sandbur (*Cenchrus echinatus*), tall morningglory (*Ipomoea purpurea*), tropical spiderwort (*Commelina benghalensis*), W20 Soybean (*Glycine max v. W20*), W4-4 Soybean (*Glycine max v. W4-4*), corn (*Zea mays v. Pioneer 3394*) and wild pointsettia (*Eupohorbia heterophylla*).

Treated plants and untreated controls were maintained in a greenhouse for approximately 13 days, after which all treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table G, are based upon a 0 to 100 scale where 0 is no effect and 100 is complete control.

Table G	COMPOUND
Rate 140 g/ha	23
POSTEMERGENCE	
Acanthospermum	100
Alexandergrass	100
Apple-of-Peru	100
Arrowleaf Sida	80
Surinam grass	100
Bl. Nightshade	100
Braz Sicklepod	80
Capim-Colch	100
Corn	20
Crist. Soybean	100
Fl. Beggarweed	100
H. Beggarticks	85
Morningglory	90
Sl. Amaranth	100
Southern Sandur	85
Tr. Spiderwort	100
Wld Pointsettia	100
W20 Soybean	100
W4-4 Soybean	100

Table G	COMPOUND
Rate 70 g/ha	23
POSTEMERGENCE	
Acanthospermum	100
Alexandergrass	100
Apple-of-Peru	80
Arrowleaf Sida	70
Surinam grass	100
Bl. Nightshade	100
Braz Sicklepod	65
Capim-Colch	100
Corn	15
Crist. Soybean	100
Fl. Beggarweed	85
H. Beggarticks	75
Morningglory	80
Sl. Amaranth	90
Southern Sandur	80
Tr. Spiderwort	90
Wld Pointsettia	85
W20 Soybean	100
W4-4 Soybean	100

Table G	COMPOUND
Rate 35 g/ha	23
POSTEMERGENCE	
Acanthospermum	100
Alexandergrass	100
Apple-of-Peru	80
Arrowleaf Sida	65
Surinam grass	100
Bl. Nightshade	100
Braz Sicklepod	60
Capim-Colch	100
Corn	0
Crist. Soybean	100
Fl. Beggarweed	85
H. Beggarticks	70
Morningglory	70
Sl. Amaranth	80
Southern Sandur	50
Tr. Spiderwort	80
Wld Pointsettia	85
W20 Soybean	90
W4-4 Soybean	100

Table G	COMPOUND
Rate 17 g/ha	23
POSTEMERGENCE	
Acanthospermum	100
Alexandergrass	100
Apple-of-Peru	75
Arrowleaf Sida	60
Surinam grass	90
Bl. Nightshade	100
Braz Sicklepod	35
Capim-Colch	65
Corn	0
Crist. Soybean	90
Fl. Beggarweed	85
H. Beggarticks	80
Morningglory	65
Sl. Amaranth	80
Southern Sandur	45
Tr. Spiderwort	70
Wld Pointsettia	70
W20 Soybean	80
W4-4 Soybean	100

Table G	COMPOUND
Rate 8 g/ha	23
POSTEMERGENCE	
Acanthospermum	55
Alexandergrass	85
Apple-of-Peru	65
Arrowleaf Sida	40
Surinam grass	80
Bl. Nightshade	85
Braz Sicklepod	10
Capim-Colch	60
Corn	0
Crist. Soybean	85
Fl. Beggarweed	100
H. Beggarticks	75
Morningglory	60
Sl. Amaranth	75
Southern Sandur	45
Tr. Spiderwort	65
Wld Pointsettia	70
W20 Soybean	75
W4-4 Soybean	90

TEST H

Compounds evaluated in this test were formulated in a non-phytotoxic solvent mixture which includes a surfactant and applied to plants that were in the one-to four leaf stage (postemergence application). A mixture of sandy loam soil and greenhouse potting mix in a 60:40 ratio was used for the postemergence test.

Plantings of these crops and weed species were adjusted to produce plants of appropriate size for the postemergence test. All plant species were grown using normal greenhouse practices. Crop and weed species include annual bluegrass (*Poa annua*), blackgrass (*Alopecurus myosuroides*), black nightshade (*Solanum nigra*), chickweed (*Stellaria media*), common poppy (*Papaver rhoeas*), deadnettle (*Lamium amplexicaule*), downy brome (*Bromus tectorum*), field violet (*Viola arvensis*), galium (*Galium aparine*), green foxtail (*Setaria viridis*), jointed goatgrass (*Aegilops cylindrica*), kochia (*Kochia scoparia*), lambsquarters (*Chenopodium album*), littleseed canarygrass (*Phalaris minor*), rape (*Brassica napus*), redroot pigweed (*Amaranthus retroflexus*), Russian thistle (*Salsola kali*), ryegrass (*Lolium multiflorum*), scentless chamomile (*Matricaria inodora*), spring barley (*Hordeum vulgare*), sugar beet (*Beta vulgaris*), sunflower (*Helianthus annuus*), ivyleaf speedwell (*Veronica hederaefolia*), spring wheat (*Triticum aestivum*), winter wheat (*Triticum aestivum*), wild buckwheat (*Polygonum convolvulus*), wild mustard (*Sinapis arvensis*), wild oat (*Avena fatua*), windgrass (*Apera spica-venti*) and winter barley (*Hordeum vulgare*).

Treated plants and untreated controls were maintained in a greenhouse for approximately 21 to 28 days, after which all treated plants were compared to untreated controls and visually evaluated. Plant response ratings, summarized in Table H, are based upon a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash response (-) means no test result.

Table H	COMPOUND
Rate 125 g/ha	15
POSTEMERGENCE	
Annual Bluegras	0
Blackgrass	0
Blk Nightshade	75
Chickweed	85
Common poppy	55
Deadnettle	75
Downy brome	0
Field violet	75
Galium	30
Green foxtail	30
Jointed Goatgra	0
Kochia	85
Lambsquarters	75
LS Canarygrass	0
Rape	85
Redroot Pigweed	75
Russian Thistle	10
Ryegrass	0
Scentless Chamo	60
Spring Barley	0
Sugar beet	100
Sunflower	55
Veronica hedera	40
Wheat (Spring)	0
Wheat (Winter)	0
Wild buckwheat	75
Wild mustard	95
Wild oat	0
Windgrass	0
Winter Barley	0

Table H	COMPOUND			
Rate 62 g/ha	13	15	22	25
POSTEMERGENCE				
Annual Bluegras	10	0	100	65
Blackgrass	5	0	30	55
Blk Nightshade	60	75	100	100
Chickweed	45	75	100	100
Common poppy	10	50	-	100
Deadnettle	90	70	100	100
Downy brome	20	10	60	60
Field violet	100	75	70	100
Galium	40	50	40	60
Green foxtail	65	30	60	100
Jointed Goatgra	5	0	30	50
Kochia	80	60	100	60
Lambsquarters	85	80	100	100
LS Canarygrass	15	0	100	100
Rape	30	70	-	100
Redroot Pigweed	30	70	100	75
Russian Thistle	50	0	100	50
Ryegrass	5	0	35	10
Scentless Chamo	0	60	100	70
Spring Barley	10	0	40	5
Sugar beet	85	100	-	100
Sunflower	5	50	-	95
Veronica hedera	55	30	-	60
Wheat (Spring)	10	0	90	65
Wheat (Winter)	10	0	100	50
Wild buckwheat	60	65	70	30
Wild mustard	65	100	100	100
Wild oat	5	0	20	95
Windgrass	20	0	70	30
Winter Barley	10	0	40	10

Table H	COMPOUND		
Rate 31 g/ha	15	22	25
POSTEMERGENCE			
Annual Bluegras	-	50	60
Blackgrass	0	20	30
Blk Nightshade	-	100	85
Chickweed	-	100	85
Common poppy	-	-	100
Deadnettle	-	100	100
Downy brome	-	40	45
Field violet	-	65	75
Galium	-	20	55
Green foxtail	0	30	100
Jointed Goatgra	-	40	45
Kochia	-	85	45
Lambsquarters	-	100	100
LS Canarygrass	-	65	65
Rape	-	-	85
Redroot Pigweed	-	100	75
Russian Thistle	-	90	30
Ryegrass	0	20	10
Scentless Chamo	-	100	70
Spring Barley	0	20	65
Sugar beet	-	-	100
Sunflower	-	-	70
Veronica hedera	-	-	40
Wheat (Spring)	0	30	55
Wheat (Winter)	0	60	30
Wild buckwheat	-	35	30
Wild mustard	-	100	100
Wild oat	0	10	40
Windgrass	-	40	40
Winter Barley	0	20	5

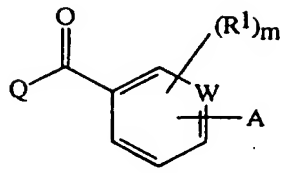
Table H	COMPOUND		
Rate 16 g/ha	13	22	25
POSTEMERGENCE			
Annual Bluegras	5	40	50
Blackgrass	0	20	20
Blk Nightshade	35	100	100
Chickweed	15	100	75
Common poppy	5	-	60
Deadnettle	60	100	100
Downy brome	0	50	10
Field violet	60	50	-
Galium	10	20	50
Green foxtail	30	20	85
Jointed Goatgra	0	20	0
Kochia	60	70	35
Lambsquarters	50	100	100
LS Canarygrass	10	60	60
Rape	30	-	70
Redroot Pigweed	20	100	70
Russian Thistle	40	80	30
Ryegrass	2	20	5
Scentless Chamo	0	100	60
Spring Barley	5	30	2
Sugar beet	20	-	75
Sunflower	0	-	65
Veronica hedera	30	-	55
Wheat (Spring)	5	30	25
Wheat (Winter)	5	30	20
Wild buckwheat	30	50	5
Wild mustard	45	100	100
Wild oat	0	0	50
Windgrass	10	30	30
Winter Barley	0	20	5

Table H	COMPOUND
Rate 8 g/ha	25
POSTEMERGENCE	
Annual Bluegras	30
Blackgrass	10
Blk Nightshade	75
Chickweed	60
Common poppy	50
Deadnettle	60
Downy brome	15
Field violet	50
Galium	50
Green foxtail	50
Jointed Goatgra	0
Kochia	45
Lambsquarters	100
LS Canarygrass	50
Rape	60
Redroot Pigweed	70
Russian Thistle	10
Ryegrass	2
Scentless Chamo	50
Spring Barley	0
Sugar beet	50
Sunflower	60
Veronica hedera	50
Wheat (Spring)	10
Wheat (Winter)	20
Wild buckwheat	0
Wild mustard	70
Wild oat	10
Windgrass	30
Winter Barley	2

CLAIMS

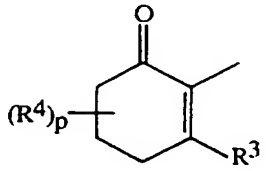
What is claimed is:

1. A compound selected from the formula

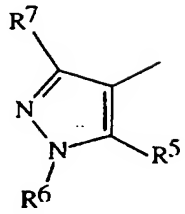


and *N*-oxides and agriculturally suitable salts thereof, wherein

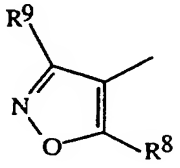
Q is



Q-1

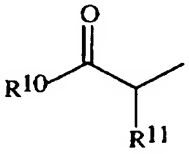


Q-2



Q-3

or



Q-4

;

A is a five- to ten-membered monocyclic or fused bicyclic ring system, which may be fully aromatic or partially saturated, containing 1 to 4 heteroatoms independently selected from the group nitrogen, oxygen, and sulfur, provided that each heterocyclic ring system contains no more than 2 oxygens and no more than 2 sulfurs, and each ring system is optionally substituted with one to three R^2, provided that when a nitrogen atom of a heterocyclic ring is substituted with R^2, then R^2 is other than halogen;

each R^1 is independently H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, halogen, cyano, nitro, $-(Y)_t-S(O)_nR^{15}$ or $-(Y)_t-C(O)R^{15}$;

W is N or CH;

Y is O or NR^{12};

R^2 is C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_3-C_6 alkenyloxy, C_3-C_6 alkynyloxy, mercapto, C_1-C_6 alkylthio, C_1-C_3 haloalkylthio, C_3-C_6 alkenylthio, C_3-C_6 haloalkenylthio, C_3-C_6 alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5 acetylalkylthio, C_3-C_6 alkoxycarbonylalkylthio, C_2-C_4 cyanoalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, aminosulfonyl, C_1-C_2 alkylaminosulfonyl, C_2–C_4 dialkylaminosulfonyl, $(CH_2)_rR^{16}$, $NR^{12}R^{13}$, halogen, cyano or nitro; or R^2 is phenyl or benzylthio, each optionally substituted on the phenyl ring with C_1-C_3 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy, 1-2 halogen, cyano or nitro;

R^3 is OR^{14}, SH, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, halogen or $NR^{12}R^{13}$; or R^3 is phenylthio, phenylsulfonyl or $-SCH_2C(O)Ph$, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro;

each R^4 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, C_1-C_3 alkylthio or halogen; or when two R^4 are attached to the same carbon atom, then said R^4 pair can be taken together to form $-OCH_2CH_2O-$, $-OCH_2CH_2CH_2O-$, $-SCH_2CH_2S-$ or $-SCH_2CH_2CH_2S-$, each group optionally substituted with 1-4 CH_3;

R^5 is OR^{14}, SH, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, halogen or $NR^{12}R^{13}$; or R^5 is phenylthio, phenylsulfonyl or $-SCH_2C(O)Ph$, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro;

R^6 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 alkynyl or $-CH_2CH_2OR^{12}$; or R^6 is phenyl or benzyl, each optionally substituted on the phenyl ring with C_1-C_3 alkyl, halogen, cyano or nitro;

R^7 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, halogen, cyano or nitro;

R^8 is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 cycloalkyl or C_3-C_6 halocycloalkyl;

R^9 is H, C_2-C_6 alkoxycarbonyl, C_2-C_6 haloalkoxycarbonyl, CO_2H or cyano;

R^{10} is C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 cycloalkyl optionally substituted with 1-4 C_1-C_3 alkyl or C_3-C_6 halocycloalkyl;

R^{11} is cyano, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylcarbonyl, $S(O)_nR^{13}$ or $C(O)NR^{12}R^{13}$;

each R^{12} is independently H or C_1-C_6 alkyl;

R^{13} is C_1-C_6 alkyl or C_1-C_6 alkoxy; or

R^{12} and R^{13} can be taken together as $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2CH_2-$ or $-CH_2CH_2OCH_2CH_2-$;

R^{14} is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_2-C_6 alkoxyalkyl, formyl, C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, $C(O)NR^{12}R^{13}$, C_1-C_6 alkylsulfonyl or C_1-C_6 haloalkylsulfonyl; or R^{14} is phenyl, benzyl, benzoyl, $-CH_2C(O)$phenyl or phenylsulfonyl, each optionally substituted on the phenyl ring with C_1-C_3 alkyl, halogen, cyano or nitro;

R^{15} is $NR^{12}R^{13}$, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_3-C_6 alkenyl, C_3-C_6 haloalkenyl, C_3-C_6 alkynyl, C_3-C_6 haloalkynyl or C_3-C_6 cycloalkyl; or R^{15} is phenyl optionally substituted with C_1-C_3 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy, 1-2 halogen, cyano or nitro;

R^{16} is C_1-C_3 alkoxy, C_2-C_4 alkoxycarbonyl, C_1-C_3 alkylthio, C_1-C_3 alkylsulfinyl or C_1-C_3 alkylsulfonyl; or R^{16} is phenyl optionally substituted with C_1-C_3 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy, C_1-C_3 haloalkoxy, 1-2 halogen, cyano or nitro;

m is 0, 1, 2 or 3;

n is 0, 1 or 2;

p is 0, 1, 2, 3 or 4;

r is 1, 2 or 3; and

t is 0 or 1;

provided that when W is CH and A is in the *meta* position with respect to the group Q-C(O)- of Formula I, then m is 3 and R^1 is other than H.

2. A compound of Claim 1 wherein

A is selected from the group 1*H*-pyrrolyl; furanyl; thienyl; 1*H*-pyrazolyl; 1*H*-imidazolyl; isoxazolyl; oxazolyl; isothiazolyl; thiazolyl; 1*H*-1,2,3-triazolyl; 2*H*-1,2,3-triazolyl; 1*H*-1,2,4-triazolyl; 4*H*-1,2,4-triazolyl; 1,2,3-oxadiazolyl; 1,2,4-oxadiazolyl; 1,2,5-oxadiazolyl; 1,3,4-oxadiazolyl; 1,2,3-thiadiazolyl; 1,2,4-thiadiazolyl; 1,2,5-thiadiazolyl; 1,3,4-thiadiazolyl; 1*H*-tetrazolyl; 2*H*-tetrazolyl; pyridinyl; pyridazinyl; pyrimidinyl; pyrazinyl; 1,3,5-triazinyl; 1,2,4-triazinyl; and A may optionally be substituted by one to three R^2, provided that when a nitrogen atom of a heterocyclic ring is substituted with R^2, then R^2 is other than halogen.

3. A compound of Claim 2 wherein

Q is Q-1.

4. A compound of Claim 3 wherein

each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;

R^3 is OR^{14}; and

R^{14} is H or C_1-C_4 alkylsulfonyl; or R^{14} is benzoyl or phenylsulfonyl, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro.

5. A compound of Claim 4 wherein
A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;
R^2 is $-(Y)_t-S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;
R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

6. A compound of Claim 2 wherein:
Q is Q-2.

7. A compound of Claim 6 wherein:
each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;
R^5 is OR^{14};
R^{14} is H or C_1-C_4 alkylsulfonyl; or R^{14} is benzoyl or phenylsulfonyl, each optionally substituted with C_1-C_3 alkyl, halogen, cyano or nitro.
R^6 is H, C_1-C_6 alkyl, or C_3-C_6 alkenyl; and
R^7 is H.

8. A compound of Claim 7 wherein
A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;
R^2 is $-(Y)_t-S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;
R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

9. A compound of Claim 2 wherein
Q is Q-3.

10. A compound of Claim 9 wherein
each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;
R^8 is H, C_1-C_3 alkyl, or cyclopropyl; and
R^9 is H or C_2-C_3 alkoxycarbonyl.

11. A compound of Claim 10 wherein
A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;

R^2 is $-(Y)_t-S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;
R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

12. A compound of Claim 2 wherein
Q is Q-4.

13. A compound of Claim 12 wherein
each R^1 is independently C_1-C_3 alkyl, C_1-C_3 alkoxy, halogen or nitro;
R^{10} is C_3-C_6 cycloalkyl or C_3-C_6 halocycloalkyl, each optionally substituted with 1-4 C_1-C_3 alkyl; and
R^{11} is cyano or C_2-C_6 alkoxycarbonyl.

14. A compound of Claim 13 wherein
A is pyridinyl, pyridazinyl, pyrimidinyl or 1*H*-pyrazolyl;
R^2 is $-(Y)_t-S(O)_nR^{15}$, CF_3, OCF_3, OCF_2H or cyano;
R^{15} is C_1-C_6 alkyl;
t is 0; and
n is 2.

15. The compound of Claim 5 which is selected from the group
a) 3-hydroxy-2-[[6-(trifluoromethyl)[2,4'-bipyridin]-3-yl]carbonyl]-2-cyclohexen-1-one;
b) 2-[2-chloro-4-(4-pyridinyl)benzoyl]-3-hydroxy-2-cyclohexen-1-one; and
c) 2-[2,5-dimethyl-3-(1-methyl-1*H*-pyrazol-3-yl)-4-(methylsulfonyl)benzoyl]-3-hydroxy-2-cyclohexen-1-one.

16. A herbicidal composition comprising a herbicidally effective amount of a compound of Claim 1 and at least one of a surfactant, a solid diluent or a liquid diluent.

17. A method for controlling the growth of undesired vegetation comprising contacting the vegetation or its environment with a herbicidally effective amount of a compound of Claim 1.

INTERNATIONAL SEARCH REPORT

Intern nal Application No
PCT/US 97/09569

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C07D213/50 A01N43/40 A01N43/56 A01N43/78 A01N43/80
C07D213/53 C07D231/12 C07D231/20 C07D277/24 C07D401/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 C07D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 39 02 818 A (SANDOZ AG) 10 August 1989 see page 35 - page 36, paragraph 1 see page 38; claims 33,34	1-5,16, 17
A	GB 2 122 188 A (NISSAN CHEMICAL IND LTD) 11 January 1984 see the whole document; in particular page 25; table 5, compound no. 3.9	1,2,6-8, 16,17
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[X] Further documents are listed in the continuation of box C.

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30 September 1997	08. 10. 97

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